EASA
European Union Aviation Safety Agency

Strategy & Safety Management Directorate

Safety Intelligence & Performance Department

Annual Safety Recommendations Review 2020

List of Safety Recommendation Replies

List of 2020 Safety Recommendations Replies

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Spain

Registration	Aircraft Type	Location	Date of event	Event Type
EC-GDG	SWEARINGEN SA226	Gavá	18/02/1998	Accident

Synopsis of the event:

The aircraft crashed on approach after having requested a return to the airfield after a departure from Barcelona. The accident was likely caused by an improper descent angle during the approach, combined with possible crew fatigue. The left engine may also have been malfunctioning causing an extra workload for the crew.

Safety Recommendation SPAN-2012-011:

It is recommended that the European Aviation Safety Agency (EASA) study the viability of introducing a requirement into the operational regulations that cockpit voice and flight data recorders of given specifications be installed on turboprop aircraft authorized for IFR flights and used for the public transport or passengers or cargo, regardless of their weight or maximum number of seats.

Reply No 1 sent on 25/09/2012: EASA acknowledges receipt of this Safety Recommendation. Please be advised that it is under consideration and that the outcome will be communicated to you in due course.

This reply gives the status within the 90 days period in compliance with Article 18 of Regulation (EU) No 996/2010.

Reply No 2 sent on 18/12/2012: Rulemaking tasks RMT.0271 and RMT.0272 'Recorders for small aircraft' are on the Agency's Rulemaking Programme. This Safety Recommendation will be considered during these tasks, which are planned to be launched in 2013.

Reply No 3 sent on 01/08/2014: The Agency's rulemaking tasks RMT.0271 and RMT.0272 'In-flight recording for light aircraft' were launched on 25 July 2014 with the publication of the associated Terms of Reference.

This safety recommendation is being considered within the framework of these tasks.

Reply No 4 sent on 22/06/2020: According to CAT.IDE.A.185 of Annex IV (Part-Commercial Air Transport (CAT) operations) to Commission Regulation (EU) No 965/2012 on air operations, all aeroplanes with a Maximum Certified Take-Off Mass (MCTOM) of more than 5 700 kg shall be equipped with a cockpit voice recorder (CVR), regardless of the date of first issuance of the individual Certificate of Airworthiness (CofA). In addition, according to CAT.IDE.A.190 of Part-CAT, all turbine-engined aeroplanes with an MCTOM of more than 5 700 kg shall be equipped with a Flight Data Recorder (FDR), regardless of the date of first issuance of the individual CofA.

When considering aeroplanes with an MCTOM of 5 700 kg or less (hereafter called "light aeroplanes"), according to CAT.IDE.A.185 the following aeroplanes are required to be equipped with a CVR: multi-engined turbine-powered aeroplanes with an MOPSC (Maximum Operational Passenger Seating Configuration) of more than nine and first issued with an individual CofA on or after 1 January 1990. If, in addition, such an aeroplane was first issued with an individual CofA on or after 1 April 1998, it shall also be equipped with an FDR, according to CAT.IDE.A.190. These requirements are applicable to aircraft models such as the SA-226-TC Metro II.

This means that when considering light multi-engined turbine-powered aeroplanes with an MOPSC of more than 9 that are used for CAT operations, only those that are more than 21 years old on 1 January 2020 may not be equipped with an FDR and only those that are more than 30 years old at that time may not carry a CVR. Assuming an average economic lifetime cycle of 30 years for such light aeroplanes, this means that, on 1 January 2020, most of them are required to be equipped with a CVR and about two thirds are required to be equipped with a CVR and an FDR.

Nevertheless, mandating flight recorder carriage on board categories of light aeroplanes not in the scope of CAT.IDE.A.185 and CAT.IDE.A.190 was considered within the framework of the European Union Aviation Safety Agency (EASA) rulemaking tasks RMT.0271 and RMT.0272 'In-flight recording for light aircraft'.

EASA Opinion No 02/2019, published on 22 February 2019, contained proposed amendments to the air operations regulation stemming from RMT.0271 and RMT.0272. This Opinion was adopted, and the associated Commission Implementing Regulation (EU) 2019/1387 was published on 05 September 2019.

The amendments published with Commission Implementing Regulation (EU) 2019/1387 extends the flight recorder carriage requirements to aeroplanes that are turbine-engined and have an MCTOM of 2 250 kg or more, or that have an MOPSC of more than nine, when they are commercially operated and first issued with an individual certificate of airworthiness on or after 05 September 2022: refer to Part-CAT, CAT.IDE.A.191. However, these amendments do not introduce flight recorder carriage requirements for currently operated light aeroplanes or for turbine-engine aeroplanes with a MCTOM of less than 2 250 kg.

Indeed, the outcome of the impact assessment conducted under RMT.0271 and RMT.0272 (refer to EASA notice of proposed amendment 2017-03) was that promoting voluntary installation of in-flight recording systems was the most appropriate way forward when considering currently operated light aeroplanes and the lightest aeroplane models. In order to facilitate such voluntary installation, issue 2 of the certification specifications for standard changes and standard repairs (CS-STAN) introduced a new sub-paragraph SC-104a on the installation of lightweight in-flight recording systems, aimed at facilitating the voluntary installation of in-flight recording systems on board light aeroplanes and helicopters (such a system can be installed by the means of a standard change, i.e. by a qualified maintenance engineer, without requiring change approval by the relevant authority).

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
4X-BAU	BOEING 757	London Gatwick Airport, United Kingdom	03/10/2000	Incident

Synopsis of the event:

The aircraft experienced a tyre burst on landing causing some damage to the under surface of the wing. It was concluded that the accident had probably been caused by operating with either Tyre 7 or Tyre 8 underinflated. It was possible that either or both of the tyres had previously been damaged by an earlier episode of operating while underinflated or with an underinflated partner.

Safety Recommendation UNKG-2002-014:

It is recommended that Airworthiness Authorities such as the JAA and FAA consider implementing the measures outlined in AAIB Safety Recommendations 99-11 and 99-12 concerning requirements for tyre pressure monitoring and warning systems.

Reply No 1 sent on 13/09/2010: EASA acknowledges receipt of this Safety Recommendation. Please be advised that it is under consideration and that the outcome will be communicated to you in due course.

Reply No 2 sent on 18/12/2012: The Agency prepared a pre-Regulatory Impact Assessment (pre-RIA) proposing the creation of a rulemaking task that would require the installation of a tyre pressure monitoring system on large aeroplanes. The pre-RIA will be used to consult with our advisory bodies representing aviation authorities and industry. The Agency will make a decision to create a rulemaking task after this consultation.

Reply No 3 sent on 07/07/2017: With the amendment 14 of CS-25 (effective on 20 December 2013, applicable to new certification projects of large aeroplanes), the Agency introduced new certification specifications to upgrade the protection against the damaging effects of tyre and wheel failures.

However, the Agency has initiated a new rulemaking task, RMT.0586, to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer.

The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA Website:
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

Mandating the installation of a tyre pressure monitoring system is one of the elements to be considered among the objectives of RMT.0586.

The next step of RMT.0586 is the publication of a Notice of Proposed Amendment (NPA) which is envisaged during 03Q2018.

Reply No 4 sent on 22/06/2020: With amendment 14 of CS-25 (Certification specifications and acceptable means of compliance for large aeroplanes) (effective as of 20 December 2013, applicable to new certification projects of large aeroplanes), the European Union Aviation Safety Agency (EASA) introduced new certification specifications to upgrade protection against the damaging effects of tyre and wheel failures.

After that, EASA initiated rulemaking task RMT.0586 to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer.
The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA website:
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

This safety recommendation has been taken into account in this rulemaking task. Notice of Proposed Amendment (NPA) 2020-05 ('Tyre pressure monitoring') was published for consultation on 6 March 2020:
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-05

This NPA proposes to amend CS-25 to require applicants to provide a means to ensure that no tyre is below its minimum serviceable inflation pressure during operation. This can be achieved either by providing a task in the instructions for continued airworthiness (ICA) that requires operators to perform tyre pressure checks at a suitable time interval (i.e. daily or at another substantiated interval), or by installing a tyre pressure monitoring system that alerts the flight crew in the case of a tyre with an unsafe pressure. It also proposes to amend Annex I (Part-26) to Commission Regulation (EU) 2015/640) and CS-26 (Certification specifications and guidance material for additional airworthiness specifications for operations) to require the same objective to be implemented by operators of large aeroplanes, i.e. either by including in the aeroplane maintenance programme (AMP) tyre inflation pressure checks at a suitable time interval, or by installing a tyre pressure monitoring system. The related EASA Decision and Opinion are scheduled for Q1/2021.

Reply No 5 sent on 03/03/2021: With amendment 14 of the certification specification CS-25 (effective on 20 December 2013, applicable to new certification projects of large aeroplanes), the European Union Aviation Safety Agency (EASA) introduced new certification specifications to upgrade the protection against the damaging effects of tyre and wheel failures.

After that, EASA initiated rulemaking task RMT.0586 to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer.
The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA website:
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

This safety recommendation has been taken into account in this rulemaking task.
Notice of Proposed Amendment (NPA) 2020-05 ('Tyre pressure monitoring') was published for consultation on 6 March 2020:
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-05

Executive Director (ED) Decision 2020/024/R on amendment 26 of CS-25 was published on 22 December 2020.
https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2020024r
This therefore applies to the certification of new large aeroplane designs.
A new objective based certification specification CS 25.733(f) has been created to require that the applicant provides a means to minimise the risk that a tyre is below its minimum serviceable inflation pressure during operation. The corresponding new acceptable means of compliance AMC 25.733(f) indicates how the applicant can demonstrate compliance.
These new provisions are not prescriptive and do not universally mandate the installation of a system indicating the tyre inflation pressures in the cockpit. The applicant should use one, or a combination, of the following means:
(a) Provide a task in the Instructions for Continued Airworthiness (ICA) that requires tyres inflation pressure checks to be performed at a suitable time interval,
(b) Install a system that monitors the tyres inflation pressures and:
(1) provides an alert to the flight crew, in compliance with CS 25.1322, whenever a tyre inflation pressure is below the minimum serviceable inflation pressure, or
(2) allows the tyres inflation pressures to be checked prior to the dispatch of the aeroplane, and a tyre inflation pressure check task is included in the Aeroplane Flight Manual (AFM) pre-flight procedures.

Concerning already certified large aeroplanes, EASA plans to issue an Opinion to the European Commission that intends to propose an amendment to Part-26 (Annex I) to Commission Regulation (EU) 2015/640 to require operators of large aeroplanes to minimise the risk that a tyre is below its minimum serviceable inflation pressure during operation. Certification specifications to comply with this requirement is also planned to be adopted by EASA in an amendment to CS-to26. Flexibility would be provided to the operators who may choose to include a task in the aeroplane maintenance programme (AMP) to perform tyre inflation pressure checks at a suitable time interval, and/or install a system that monitors the tyres inflation pressures.

The Opinion is scheduled for publication during Q3 2021.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-CRST	AGUSTA A109	London	16/01/2013	Accident

Synopsis of the event:

The helicopter was flying to the east of Battersea Heliport when it struck the jib of a crane, attached to a building development at St George Wharf, at a height of approximately 700 ft in conditions of reduced meteorological visibility. The pilot, who was the sole occupant of the helicopter, and a pedestrian were fatally injured when the damaged helicopter impacted a building and adjacent roadway.

The pilot was probably unaware of the proximity of the building and did not see the crane or saw it to late. The flight was continued to the destination despite being unable to remain clear of cloud.

Safety Recommendation UNKG-2014-034:

It is recommended that the European Aviation Safety Agency assess whether mandating the use of Helicopter Terrain Awareness and Warning Systems compliant with Technical Standard Order C194 or European Technical Standard Order C194 would provide safety benefits for helicopter operations within Europe.

Reply No 1 sent on 29/10/2014: The Agency understands that, based on the type of operation performed, this safety recommendation is related to Commercial Air Transport (CAT) operations. Whilst it is acknowledged that the aircraft involved in the accident was operating under UK national legislation, it should be noted that EU regulations for CAT operations, published in 2012, shall be applied by EASA Member States by 28 October 2014 at the latest.

The Agency considers that Commission Regulation (EU) No 965/2012, as last amended ('air operations regulation'), and Commission Implementing Regulation (EU) No 923/2012 ('rules of the air regulation'), together with the basic flying skills that are instructed in accordance with Commission Regulation (EU) No 1178/2011 ('aircrew regulation'), already provide operational and flight crew training mitigation against the risk collision with the ground or obstacles.

The additional safety benefits from the use of Helicopter Terrain Awareness and Warning Systems will be assessed for each type of helicopter operation within the framework of a

future rulemaking task.

Reply No 2 sent on 27/04/2016: The Agency understands that, based on the type of operation performed during the accident, this safety recommendation is related to Commercial Air Transport (CAT) operations. Whilst it is acknowledged that the aircraft involved in the accident was operating under UK national legislation, it should be noted that, since 28 October 2014 at the latest, CAT operations should comply with Commission Regulation (EU) No 965/2012.

The use of Helicopter Terrain Awareness and Warning Systems (HTAWS) for providing mitigation against the risk of CFIT for all types of helicopter operation is currently being considered within the framework of a dedicated preliminary impact assessment. This will include an evaluation of mandating the use of HTAWS compliant with Technical Standard Order C194 or European Technical Standard Order C194.

Any associated action will depend of the results of the assessment which is expected to be completed by mid-2016.

Reply No 3 sent on 20/12/2016: The Agency understands that, based on the type of operation performed during the accident, this safety recommendation is related to Commercial Air Transport (CAT) operations. Whilst it is acknowledged that the aircraft involved in the subject accident was operating under national legislation at the time, it should be noted that, since 28 October 2014 at the latest, CAT operations are required to be conducted in accordance with Commission Regulation (EU) No 965/2012 on air operations.

Helicopters used in offshore Commercial Air Transport (CAT) operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Regulation No 965/2012 on air operations).

EASA has conducted a Preliminary Impact Assessment (PIA) to determine and prioritise any actions that the Agency should take to address the related safety issues. One of the candidate actions is Controlled Flight into Terrain (CFIT) prevention with HTAWS.

In response to the September 2016 PIA findings, the Agency intends to introduce a new Rulemaking Task (RMT) into its Rulemaking Programme (RMP) for 2017-2021, in order to :

• consider extending the existing HTAWS requirements for offshore helicopter operations to include those helicopters first issued with an individual Certificate of Airworthiness (CofA) on or before 31 December 2018 (ie retrofit).

• consider mandating HTAWS on board helicopters used for CAT other than offshore helicopter operations, including Helicopter Emergency Medical Service (HEMS) operations. The helicopter size threshold will be determined during the task, and may be expressed in MCTOM, MOPSC, Instrument Flight Rules (IFR) or Visual Flight Rules (VFR), or a combination of these criteria. For VFR operations, the PIA results foresee the MCTOM threshold to be between 2 500 kg and 3 175 kg.

It should be noted that research programmes have been taking place to improve HTAWS software in order to increase the time between the first caution or warning and impact without generating more false warnings. Further research may still be needed, and an improved European Technical Standard Order (ETSO) be published, before mandating retrofit for the existing helicopter fleet.

The Agency's Rulemaking Programme for 2017-2021 is expected to be published in the fourth quarter of 2016, after consultation with the EASA Member States' Advisory Body (MAB) and the Stakeholders Advisory Body (SAB).

In the meantime, safety promotion material produced by the European Helicopter Safety Team (EHEST) already addresses some of the root causes of CFIT accidents. For example, 'HE9 Automation and flight path management' for IFR flights (published in September 2015) and 'Helicopter Flight Instructor Manual' for unplanned flying in Instrument Meteorological Conditions (IMC) during VFR flights (published in June 2015).

Reply No 4 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) understands that, based on the type of operation performed during the accident, this safety recommendation is related to Commercial Air Transport (CAT) operations. Whilst it is acknowledged that the aircraft involved in the subject accident was operating under national legislation at the time, it should be noted that, since 28 October 2014 at the latest, CAT operations are required to be conducted in accordance with Commission Regulation (EU) No 965/2012 on air operations.

Helicopters used in offshore CAT operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Commission Regulation (EU) No 965/2012 on air operations).

EASA is currently considering:

• extending the existing HTAWS requirements for helicopter offshore operations to include those helicopters first issued with an individual Certificate of Airworthiness (CofA) on or before 31 December 2018; and

• mandating HTAWS on board helicopters used for CAT other than helicopter offshore operations. The helicopter size threshold will be determined during the task, and may be expressed in MCTOM, MOPSC, Instrument Flight Rules (IFR) or Visual Flight Rules (VFR),

or a combination of these criteria. For VFR operations, the HTAWS Preliminary Impact Assessment (PIA) results foresee the MCTOM threshold to be between 2 500 kg and 3 175 kg.

This work is being undertaken within the context of EASA rulemaking task RMT.0708 'Controlled flight into terrain prevention with helicopter terrain avoidance warning systems (HTAWS)'.

The associated Terms of Reference were published on 31 July 2019, and the next deliverable, a Notice of Proposed Amendment, is planned to be published in 2021 Q2 [see the European Plan for Aviation Safety (EPAS) 2020-2024].

The actual timelines will depend on the availability of a new HTAWS technical standard, which is currently being developed by the European Organisation for Civil Aviation Equipment (EUROCAE) and the Radio Technical Commission for Aeronautics (RTCA). This is expected to provide flight envelope warnings designed to prevent the loss of control of the helicopter in an offshore environment, as well as terrain awareness and associated warnings. As concluded by the HTAWS PIA, this new technical standard is likely to be the basis for any new regulatory provisions coming from RMT.0708, as opposed to (European) Technical Standard Order C194 which is specified in the safety recommendation.

EASA, therefore, considers this safety recommendation to be closed as the technical standard specified in the recommendation is likely to be superseded in the future deliverables stemming from RMT.0708. Progress on the part of the recommendation on mandating the use of HTAWS will, anyway, be visible through updates from EASA to safety recommendation UNKG-2016-013 from the UK AAIB aircraft accident report 1/2016 on the accident to AS332 L2 Super Puma helicopter, G-WNSB on approach to Sumburgh Airport on 23 August 2013.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-HBNI	AIRBUS A320	Bordeaux Airport-France	02/08/2013	Serious incident

Synopsis of the event:

En approche sur l'aérodrome de Bordeaux – Mérignac, l'équipage d'un Airbus A320 d'Air France traverse un orage de grêle. L'avion est soumis à un important cisaillement de vent. L'assiette de l'avion augmente jusqu'à environ 25° sous pilote automatique et la vitesse descend jusqu'à 109 kt. L'avion descend au maximum d'environ 200 pieds. L'équipage remet les gaz. L'alarme de décrochage retentit et la protection en incidence « Alpha Floor » se déclenche. L'équipage poursuit l'approche après être sorti de l'orage de grêle.
L'équipage effectuait le troisième et dernier vol de la journée. Une passagère, qui est copilote dans la compagnie, était présente dans le poste de pilotage lors de la totalité du vol. Elle est intervenue dans les échanges de l'équipage pour décider de la trajectoire à suivre.
L'enquête du BEA a conclu que la décision inappropriée du commandant de bord de débuter l'approche, alors qu''une cellule orageuse se trouvait sur la trajectoire d'approche résulte de la rupture progressive du fonctionnement CRM de l'équipage, qui n'a pas su arriver à une décision partagée sur la trajectoire d'arrivée et d'approche. Les interventions spontanées de la troisième personne présente en cockpit, et le souvenir d'une rotation que le commandant de bord et le copilote ont eu trois ans auparavant ont probablement contribué à cette déstructuration du CRM et à l'inefficacité de leur stratégie TEM.
L'absence d'information de vol précise sur la situation météorologique fournie par le contrôleur, la répétition de messages d'une situation météorologique dégagée sur l'aérodrome ont pu contribuer à la sous-estimation des risques liés à la situation météorologique.

Safety Recommendation FRAN-2015-068:

L'AESA, en coordination avec les autres autorités de certification, évalue le besoin de modifier pour tout avion protégé en incidence les conditions de certification pour que l'alarme de décrochage se déclenche de façon pertinente, y compris en cas d'activation pertinente du système de protection, et qu'elle s'assure que sont définies des procédures et une formation des équipages associés. [Recommandation 2015-068]

Reply No 1 sent on 29/03/2016: EASA will contact all EU TC holders with fly-by-wire aeroplanes to initiate an assessment of the adequacy of stall warning settings in normal

law (protected envelope), with the exception of Airbus, for which such evaluation has already been completed till the implementation of the appropriate changes.
In parallel, EASA will contact as well the relevant foreign authorities to request them to conduct the same investigation.
The outcome of the assessment will identify the possible need for any further action.

Reply No 2 sent on 24/08/2020: The European Union Aviation Safety Agency (EASA) has contacted all European Union tvpe certificate holders and the relevant foreign authorities about fly-by-wire aeroplanes with pitch envelope protection (Models: Dassault Falcon 7X, Boeing 777, Boeing 787, Airbus Canada A220, Gulfstream GVI, Gulfstream GVII, Embraer ERJ 190-300, Embraer ERJ 190-400, Sukhoi RRJ-95) to assess the adequacy of stall warning settings in normal law (protected envelope).

From the evaluation carried out, only Airbus models design changes have been implemented (as detailed in our final reply to safety recommendation FRAN-2015-067, dated 29/03/2016).

For all the other models taken into account, the existing design has been assessed as satisfactory.

The associated procedures and crew training for the event that a stall warning triggers (including when the pitch protection activates) are already defined in the standard training and recovery procedures from an impending stall (or a stall). Additionally, more stringent training requirements on Upset Prevention and Recovery Training (UPRT), have been recently introduced in Commission Regulation (EU) 1178/2011 on Aircrew and Commission Regulation (EU) No 965/2012 on Air Operations.

Status: Closed

Sweden

Registration	Aircraft Type	Location	Date of event	Event Type
SE-JKJ	MD HELICOPTER 600	Kungsängen	14/07/2014	Accident

Synopsis of the event:

A helicopter of the type MD 600N started from Frösön, Östersund, for a VFR flight to Bromma, Stockholm. Close to Kungsängen at an altitude of 1500 feet, the engine stopped, and the pilot turned in an autorotation to search for suitable diversion site. In connection with the emergency landing the helicopter overturned and extensive damage occurred. The pilot was alone on board and was not injured.
There were about 30 litres of fuel remaining, which is more than the minimum amount of usable fuel. Despite of this, the engine stopped by fuel exhaustion.
In the course of the investigation, the Commission also found that the helicopter had been foiled in such an extent that it must be considered as a modification and that this action was carried out by a company which was not a part of the air transport system. This is considered as a risk factor, but it did not influence the course of the event.

The engine's fuel exhaustion was caused by a non-functioning fuel transfer system. The transfer system did not work as intended due to a clogged check valve. The check valve in the fuel transfer system had an impaired function due to contamination. Hence the remaining fuel could not be used, and the engine stopped.
Contributing to the occurrence was that the type certificate holder`s extended maintenance instruction on annual checks of the fuel transfer system was not complied with and that such functional checks were therefore not performed.

Safety Recommendation SWED-2015-002:

EASA is recommended to use appropriate means to inform the sector of which forms of foiling of an aircraft that are permitted.

Reply No 1 sent on 25/09/2015: In order to verify the feasibility of any action for EASA on the recommended topic, the Agency is currently analysing the elements under which a decor foil could be considered a modification.
Contacts will be established with the Swedish Civil Aviation Authority to provide a coordinated response. Further updates will be provided as soon as a consolidated position on the above mentioned point is achieved.

Reply No 2 sent on 22/09/2020: In accordance with annex 1 (Part-21) of Regulation (EU) 748/2012 and annex 1 (Part-M) of Regulation (EU) 1321/2014, approved Production and Maintenance Organisations shall only install or remove modifications (which includes application of foils/vinyl wraps) according to approved design data coming either from the (supplemental) type certificate holder or an appropriately rated Design Organisation Approval holder.

In December 2018, the European Union Aviation Safety Agency (EASA) informed all design organisations of the points to consider when designing changes that utilise foil or vinyl wrap through item 5 of information bulletin 2018/3 "J news". A copy of the bulletin is enclosed for SHK's information. EASA therefore considers that it has informed the relevant sector in an appropriate manner.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
N823GA	GULFSTREAM GIV	Castellet Airport	13/07/2012	Accident

Synopsis of the event:

During a visual approach to land on runway 13 at Le Castellet aerodrome, the crew omitted to arm the ground spoilers. During touchdown, the latter did not deploy.
The crew applied a nose-down input which resulted, for a short period of less than one second, in unusually heavy loading of the nose gear. The aeroplane exited the runway to the left, hit some trees and caught fire.
The runway excursion was the result of an orientation to the left of the nose gear and the inability of the crew to recover from a situation for which it had not been trained.
The investigation revealed inadequate pre-flight preparation, checklists that were not carried out fully and in an appropriate manner. A possible link between the high load on the nose gear and its orientation to the left was not demonstrated.

Safety Recommendation FRAN-2015-032:

FAA and EASA assess the appropriateness of making inhibition of the nose gear steering system at high speed on G-IVs mandatory, to prevent the nose gear from being oriented at large angles at high speed. [Recommendation 2015-032]

Reply No 1 sent on 22/12/2015: EASA has contacted the FAA and the aircraft manufacturer, in order to evaluate the appropriateness of the proposed design change and the need to take mandatory action.

Reply No 2 sent on 02/03/2020: The Federal Aviation Administration (FAA) has communicated to the European Union Aviation Safety Agency (EASA) that they plan to issue an Airworthiness Directive (AD) applicable to all Gulfstream Model G-IV aeroplanes certified in any category. It is planned to list the following actions aimed at preventing the nose gear from being oriented at large angles at high speed:

- The nose-wheel steering (NWS) servo valve manifold to be replaced;
- Related revisions to the aircraft flight manual to be incorporated.

The AD is expected to be published by Q4 2020.

Following assessment of the information available so far, EASA considers that those actions are expected to adequately mitigate the nose gear steering system issue and will keep monitoring the developments of the matter.

Reply No 3 sent on 24/08/2020: The Federal Aviation Administration (FAA) has published the Airworthiness Directive (AD) AD 2020-12-06 applicable to the Gulfstream Model G-IV aeroplanes. It lists the following actions aimed at preventing the nose gear from being oriented at large angles at high speed:

- to replace the nose wheel steering servo valve manifold;
- to incorporate revised operating procedures into the airplane flight manual (AFM);
- to do a records inspection for any incidents of un-commanded nose wheel steering turns.

The AD has been adopted by the European Union Aviation Safety Agency (EASA) and is published on the following websites:

- EASA: https://ad.easa.europa.eu/ad/US-2020-12-06
- FAA: https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgad.nsf/AOCADSearch/2BCADC7F254331FD8625858800428214?OpenDocument

EASA considers that those actions adequately prevent the re-occurrence of the nose gear being oriented at large angles at high speed.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-FRAK	DASSAULT FANJET FALCON	Portland range near to Bournemouth, UK	25/04/2015	Accident

Synopsis of the event:

The aircraft was undertaking target towing operations for a military exercise and was recovering the target whilst flying in an assigned danger area over the English Channel. With the target approximately 40 m from the aircraft, the target winch accelerated rapidly and the target struck the leading edge of the wing before detaching and travelling over the wing. Although, the launcher and the droop leading edge on the wing were damaged, the aircraft landed safely. The target winch is powered by a turbine, and the speed of the turbine is controlled by vent doors. The target winch had oversped due to a fault with the closed limit switch on the vent doors which prevented the doors from closing. The operator and manufacturer have carried out several safety actions as a result of the investigations and one Safety Recommendation is made.

Safety Recommendation UNKG-2015-037:

It is recommended that the European Aviation Safety Agency, require that Meggitt Defense Systems Inc review the design, maintenance and operation of the RM30 and similar winches to reduce the possibility of an uncommanded target acceleration during recovery.

Reply No 1 sent on 07/01/2016: EASA has contacted Meggitt Aerospace and the STC holder of the STC which approves the installation of the RM30 in the Falcon 20. A modified design of the winches reducing the possibility of an un-commanded target acceleration during recovery is expected to be ready by the first half of 2016. This modified design will be introduced in all the F20 that have the mentioned STC embodied.

In the meantime, the operator which operates those F20 with the STC embodied has modified its operational procedures for the target recovery anticipating the transition to the winch slow speed and requesting the pilot not flying to assist the tow operator by monitoring the position of the gill doors that control the winch speed; in addition, a test of the micro-switches that confirms the closed position of the gill doors has been introduced, and improvements in the visibility of the gill doors position have been achieved by painting markings on the gill doors and by re-alignment checks and enhanced lens cleaning procedure of the cameras that record the gill doors positions.

Reply No 2 sent on 22/06/2020: The European Union Aviation Safety Agency (EASA) has limited its review to the two known EASA approved STCs ("grandfathered") for which the STC of the target towing system covers both the installation of the system as a payload, and its flight operational characteristics and limitations.

There are two known European operators making use of those STCs. The two operators have implemented the following measures:
- Modification of the operational procedures for the target recovery, anticipating the transition to the winch low speed and requesting the pilot not flying to assist the tow operator by monitoring the position of the gill doors that control the winch speed.
- Regular inspection of the microswitches that confirm the closed position of the gill doors.
- Improvements in the visibility of the gill doors position by painting markings on the gill doors and by realignment checks and enhanced lens cleaning procedure of the cameras that record the gill doors position.

Then, there are differences between the two concerned operators in the way they operate the system:
One of them actually conducts specialised operations in accordance with Annex VIII (Part-SPO) of Commission Regulation (EU) No 965/2012. For the fleet of this operator, a modification of the design of the system has been introduced on all aeroplanes that perform or will perform target towing operations. The modified design consists of:
- An inspection of the microswitches has been kept each 4 hours of system operation or each 20 missions whatever occurs soonest.
- The introduction of an audio tone generator in the target tow console, proportional to the speed of the winch reeling.
- Modification of the MLCM (Microprocessor Logic Control Module) with reduced overspeed sensor thresholds.

The other operator does not operate under the common EU rules on air operations, but under a permit to fly granted by its national authority. For this case, the relevant national authority has been contacted to inform on the available design changes for the system.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-WNSB	AEROSPATIALE AS332	on approach to Sumburgh Airport in the Shetland Islands	23/08/2013	Accident

Synopsis of the event:

On 23 August 2013, an AS332 L2 Super Puma helicopter with sixteen passengers and 2 crew on board crashed in the sea during approach to land at Samburgh Airport. Four of the passengers did not survive. The helicopter was flying from Borgsten Dolphin to Aberden Airport via Sumburgh Airport for a refuelling stop. The weather conditions at Sumburgh Airport were such that the final approach to rwy 09 was flown in cloud, requiring the approach to be made by sole reference to helicopter's instruments. Although the approach vertical profile was maintained initially, insufficient collective pitch control input was applied by the commander to maintain the approach profile and the target approach speed of 80 kt. This resulted in insufficient engine power being provided and the helicopter's airspeed reduced continuously during the final approach. Control of the flightpath was lost and the helicopter continued to descent below the MDA. The decreasing airspeed went unnoticed by the pilots until a very late stage, when the helicopter was in a critically low energy state. The commander attempt to recover the situation was unsuccessful and the helicopter struck the surface of the sea aprox. 1.7 m sq west of Sumburgh Airport.

The investigation revealed that the helicopter's instruments were not monitored effectively during the latter stages of the non-precision instrument approach. This allowed the helicopter to enter a critically low energy state, from which recovery was not possible.
Visual references had not been acquired by the Minimum Descent Altitude and no effective action was taken to level the helicopter, as required by the operator's procedure for an instrument approach.

Safety Recommendation UNKG-2016-013:

It is recommended that the European Aviation Safety Agency requires the installation of Helicopter Terrain Awareness Warning Systems to all helicopters, used in offshore Commercial Air Transport operations, with a Maximum Certificated Take-off Mass (MCTOM) of more than 3,175 kg, or a Maximum Operational Passenger Seating Configuration (MOPSC) of more than nine, manufactured before 31 December 2018.

Reply No 1 sent on 27/04/2016: The European Aviation Safety Agency is currently conducting a preliminary impact assessment on the use of Helicopter Terrain Awareness Warning Systems (HTAWS) to mitigate the risk of Controlled Flight Into Terrain (CFIT) in helicopter operations. This will include an evaluation of the recommendation to require the installation of HTAWS for all helicopters used in offshore Commercial Air Transport operations, with a Maximum Certificated Take-off Mass (MCTOM) of more than 3,175 kg, or a Maximum Operational Passenger Seating Configuration (MOPSC) of more than nine, manufactured before 31 December 2018.

The assessment is expected to be completed by mid-2016.

Reply No 2 sent on 24/11/2016: Helicopters used in offshore Commercial Air Transport (CAT) operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Regulation No 965/2012 on air operations).

A Safety Risk Portfolio (SRP) for offshore CAT helicopter operations was established by the European Aviation Safety Agency (EASA) in 2014, in order to identify the associated key risk areas and safety issues (see Annual Safety Review 2014 and 2016 published on the EASA web site).

As part of the development of the SRP, EASA has conducted a Preliminary Impact Assessment (PIA) to determine and prioritise any actions that the Agency should take to address the related safety issues. One of the candidate actions is Controlled Flight into Terrain (CFIT) prevention with HTAWS.

In response to the September 2016 PIA findings, the Agency intends to introduce a new Rulemaking Task (RMT) into its Rulemaking Programme (RMP) for 2017-2021, in order to consider extending the existing HTAWS requirements for offshore helicopter operations to include those helicopters first issued with an individual Certificate of Airworthiness (CofA) on or before 31 December 2018 (ie retrofit).

It should be noted that research programmes have been taking place to improve HTAWS software in order to increase the time between the first caution or warning and impact without generating more false warnings for offshore operations. Further research may still be needed, and an improved European Technical Standard Order (ETSO) be published, before mandating retrofit for the existing offshore helicopter fleet.

The Agency's Rulemaking Programme for 2017-2021 is expected to be published in the fourth quarter of 2016, after consultation with the EASA Member States' Advisory Body (MAB) and the Stakeholders Advisory Body (SAB).

In the meantime, safety promotion material produced by the European Helicopter Safety Team (EHEST) already addresses some of the root causes of CFIT accidents. For

example, 'HE9 Automation and flight path management' for Instrument Flight Rules (IFR) flights (published in September 2015) and 'Helicopter Flight Instructor Manual' for unplanned flying in Instrument Meteorological Conditions (IMC) during Visual Flight Rules (VFR) flights (published in June 2015).

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Reply No 3 sent on 30/04/2020: Helicopters used in offshore Commercial Air Transport (CAT) operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Commission Regulation (EU) No 965/2012 on air operations).

The European Union Aviation Safety Agency (EASA) is currently considering extending the existing HTAWS requirements for offshore helicopter operations to include those helicopters first issued with an individual CofA on or before 31 December 2018.

This work is being undertaken within the context of EASA rulemaking task RMT.0708 'Controlled flight into terrain prevention with helicopter terrain avoidance warning systems (HTAWS)'.

The associated Terms of Reference were published on 31 July 2019, and the next deliverable, a Notice of Proposed Amendment, is planned to be published in 2021 Q2 [see the European Plan for Aviation Safety (EPAS) 2020-2024].

It should be noted that the actual timelines will depend on the availability of a new HTAWS technical standard, which is currently being developed by the European Organisation for Civil Aviation Equipment (EUROCAE) and the Radio Technical Commission for Aeronautics (RTCA). This is expected to provide flight envelope warnings designed to prevent the loss of control of the helicopter in an offshore environment, as well as terrain awareness and associated warnings. This standard is likely to be the basis for any new regulatory provisions coming from RMT.0708.

Status: Open

Mali

Registration	Aircraft Type	Location	Date of event	Event Type
EC-LTV	DOUGLAS DC9	Gossi	24/07/2014	Accident

Synopsis of the event:

The aeroplane took off at night from Ouagadougou airport at about 1 h 15 bound for Algiers.
During the climb, the crew made several heading changes to avoid a stormy area before reaching cruise level FL 310. A few minutes later, the aeroplane's speed, piloted by the autothrottle, decreased due to the obstruction of the pressure sensors on the engine nose cones, likely by ice crystals. The autopilot then progressively increased the aeroplane's pitch
attitude to maintain the altitude, until the aeroplane stalled. The aeroplane's stall was not recovered.
The aeroplane maintained its nose-up attitude and left bank while the control surfaces remained mainly deflected in a pitch-down attitude and with a right bank. The aeroplane struck the ground at high speed.

Safety Recommendation MALI-2016-008:

La Commission d'Enquête sur les Accidents et Incidents d'Aviation Civile du Mali et le BEA recommandent que la FAA et l'AESA s'assurent de la représentativité des simulateurs utilisés pour l'entraînement des équipages de MD80 concernant le déclenchement des dispositifs avertisseurs de l'approche du décrochage et l'absence de déconnexion du pilote automatique après le décrochage, en basse altitude et en niveau de croisière.

Reply No 1 sent on 21/07/2016: The Agency will contact both the FAA and the manufacturer to consider the recommendation.

Reply No 2 sent on 22/06/2020: Following a thorough review of the information provided by the Federal Aviation Administration (FAA), a set of actions were taken by the European Union Aviation Safety Agency (EASA) which included the identification of the European stakeholders concerned (Competent Authorities, Air Operators and Approved Training Organisations) and the planning of appropriate steps to address the issue.

As the Competent Authority for the only MD80 Full Flight Simulator in the European Union, EASA will inform the stakeholders concerned during its regular Air Crew (ACW) Technical Evaluation Board meeting of the need for the Approved Training Organisation and Air Operators to contact their data provider for further guidance on whether or not this aerodynamic model update is applicable to their Flight Simulation Training Device (FSTD) and whether any restrictions are required to be implemented in order to mitigate the likely impact on the simulator.

The stakeholders will also need to ensure whether the flaws identified during the investigation and subsequently verified by CAE Inc. appear to be limited to low speed, high altitude flight regimes involving stall warning or complete stall, since errors of up to 20 knots have been found in this device both in the insertion of the stick shaker and in the activation of the stall warning.

The stakeholders, including the competent National Aviation Authorities, will be informed that during the oversight cycle, it shall be verified that the FSTD operator has informed their MD80 customers of this problem with the aerodynamic model as discovered during the accident investigation process and confirmed by CAE Inc. and the original data provider, McDonnell-Douglas/Boeing.

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
D-0219 **D-KKEF**	GLASER DIRKS DG300LANGE FLUGZEUGBAU (Antares 18) LANGE FLUGZEUGBAU (Antares 18)	over quarry near Unterklien	18/05/2015	Accident

Synopsis of the event:

Am 18.05.2015 um ca. 12:30 Uhr ereignete sich ein Zusammenstoß zweier Luftfahrzeuge im Fluge. Dabei kollidierte das Luftfahrzeug Antares 18T mit dem Luftfahrzeug DG 300 ELAN ACRO in einer Höhe von ca. 950 m über dem Steinbruch nahe Unterklien. Das Luftfahrzeug DG 300 ELAN ACRO konnte vom Piloten nach der Kollision am Flugplatz Hohenems notgelandet werden, das Luftfahrzeug Antares 18T stürzte dabei ab.
Der Bereitschaftsdienst der Sicherheitsuntersuchungsstelle des Bundes Bereich Zivilluftfahrt wurde am 18.05.2015 um 13:10 Uhr von der Such- und Rettungszentrale der Austro Control GmbH (ACG) über den Vorfall informiert. Gemäß Art. 5 Abs. 1 der Verordnung (EU) Nr. 996/2010 wurde eine Sicherheitsuntersuchung des Unfalles eingeleitet.

Safety Recommendation AUST-2016-002:

SE/UUB/LF/2/2016 ergeht an:
Austro Control, Aero Club und EASA
Erweiterung der Mindestausrüstung:
Die Mindestausrüstung insbesondere von Segelflugzeugen, sowie von Motorsegelflugzeugen sollte in Hinblick auf Kollisionswarnsysteme erweitert werden.

Reply No 1 sent on 20/01/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for

electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all these solutions.

According the EASA Annual Safety Report 2016 the MACs contributed to 6% of the fatalities in the 2006-2015 period in Non Commercial Operations for Aeroplanes. The largest amount of fatalities involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020 is further addressing the issue under the umbrella of the safety topic "general aviation safety". The next version of the plan, (EPAS 2017-2021) will address and take further actions for MAC/NMAC in general aviation, under the umbrella "General Aviation - Preventing mid-air collisions".

Reply No 2 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
Before initiating RMT.0376, EASA undertook a detailed review and assessment of the airborne collision risk. The outcome of the assessment was summarised in a Best Intervention Strategy (BIS) that has been validated through a survey and a stakeholders' consultation.
The BIS concluded that a broader use of iConspicuity solutions and improvement of their interoperability together with a better airspace utilisation and design, while ensuring compatibility with U-space regulatory framework, should be at the heart of the future actions.
iConspicuity (or in-flight electronic conspicuity plus) means in-flight capability to transmit position of aircraft and/or to receive, process and display positions of other aircraft in a real time with the objective to enhance pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, regardless whether airborne or on the ground, that can help airspace users and other affected stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.
Therefore EASA decided that RMT.0376 will be removed from the EPAS and replaced by a strategy composed of a set of EPAS tasks compounded of existing rulemaking tasks which will be implemented through new safety promotion (SPT), research (RES) and member state tasks (MST). The best safety benefits are expected to be achieved through synergies of all proposed actions, while utilising the U-space regulatory framework as a catalyst for safety improvements.
The following bullet points summarize the collective actions which will be implemented for Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers:
• EASA, with support of technical partners, will demonstrate and validate feasibility of achieving interoperability of different iConspicuity devices/systems through network of stations while respecting data privacy requirements.

• EASA will analyse ‘Net Safety Benefit’ and ‘Operational Safety Assessment’ concepts for the use of iConspicuity devices/systems in Flight Information Services.
• EASA will facilitate installation of iConspicuity devices in all EASA certified aircraft types and promote their use by airspace users at user affordable cost.
• EASA will actively support initiatives enhancing interoperability of iConspicuity devices/systems.
• EASA will promote good practices in airspace design that reduce ‘airspace complexity’ and ‘traffic congestion’ with the aim to reduce the risk of collisions involving uncontrolled traffic.
• Member States will consider ‘airspace complexity’ and ‘traffic congestion' as safety relevant factors in airspace changes affecting uncontrolled traffic, including the changes along international borders.
• EASA will ensure technical and operational compatibility of U-space and iConspicuity solutions.
• EASA will conduct a Safety Issue Assessment (SIA) of airspace infringements.
• EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.
Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
D-0219 **D-KKEF**	GLASER DIRKS DG300LANGE FLUGZEUGBAU (Antares 18) LANGE FLUGZEUGBAU (Antares 18)	over quarry near Unterklien	18/05/2015	Accident

Synopsis of the event:

Am 18.05.2015 um ca. 12:30 Uhr ereignete sich ein Zusammenstoß zweier Luftfahrzeuge im Fluge. Dabei kollidierte das Luftfahrzeug Antares 18T mit dem Luftfahrzeug DG 300 ELAN ACRO in einer Höhe von ca. 950 m über dem Steinbruch nahe Unterklien. Das Luftfahrzeug DG 300 ELAN ACRO konnte vom Piloten nach der Kollision am Flugplatz Hohenems notgelandet werden, das Luftfahrzeug Antares 18T stürzte dabei ab.
Der Bereitschaftsdienst der Sicherheitsuntersuchungsstelle des Bundes Bereich Zivilluftfahrt wurde am 18.05.2015 um 13:10 Uhr von der Such- und Rettungszentrale der Austro Control GmbH (ACG) über den Vorfall informiert. Gemäß Art. 5 Abs. 1 der Verordnung (EU) Nr. 996/2010 wurde eine Sicherheitsuntersuchung des Unfalles eingeleitet.

Safety Recommendation AUST-2016-003:

SE/UUB/LF/3/2016 ergeht an:
Austro Control, Aero Club und EASA
Sicherstellung der Funktionsfähigkeit von Kollisionswarngeräten:
Festlegung geeigneter Maßnahmen welche sicherstellen, dass ein eingebautes Kollisionswarnsystem gemäß seinen Bestimmungen funktioniert. Im Besonderen, dass richtige und für andere Kollisionswarngeräte verwertbare Daten ausgesendet und im Umkehrschluss auch empfangen werden.

Reply No 1 sent on 20/01/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all these solutions.

According the EASA Annual Safety Report 2016 the MACs contributed to 6% of the fatalities in the 2006-2015 period in Non Commercial Operations for Aeroplanes. The largest amount of fatalities involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020 is further addressing the issue under the umbrella of the safety topic "general aviation safety". The next version of the plan, (EPAS 2017-2021) will address and take further actions for MAC/NMAC in general aviation, under the umbrella "General Aviation - Preventing mid-air collisions".

Reply No 2 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
Before initiating RMT.0376, EASA undertook a detailed review and assessment of the airborne collision risk. The outcome of the assessment was summarised in a Best Intervention Strategy (BIS) that has been validated through a survey and a stakeholders' consultation.
The BIS concluded that a broader use of iConspicuity solutions and improvement of their interoperability together with a better airspace utilisation and design, while ensuring compatibility with U-space regulatory framework, should be at the heart of the future actions.
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Therefore EASA decided that RMT.0376 will be removed from the EPAS and replaced by a strategy composed of a set of EPAS tasks compounded of existing rulemaking tasks which will be implemented through new safety promotion (SPT), research (RES) and member state tasks (MST). The best safety benefits are expected to be achieved through synergies of all proposed actions, while utilising the U-space regulatory framework as a catalyst for safety improvements.
The following bullet points summarize the collective actions which will be implemented for Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers:

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Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
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Safety Recommendation AUST-2016-004:

SE/UUB/LF/4/2016 ergeht an:
Austro Control, Aero Club und EASA
Wiederholte Aussprache der Sicherheitsempfehlung aus dem Jahre 2008
SE/UUB/LF/02/2008:
Die Empfehlung aus einem Unfallbericht aus dem Jahr 2005 (GZ. BMVIT-85.053/0008-FUS/2004) anlässlich eines Zusammenstoßes in der Luft im Jahr 2004 zu einer Verpflichtung zum Betrieb von Zusammenstoßwarngeräten muss nach diesem Zusammenstoß und einem sehr ähnlichen im November 2006 in der Nähe von Wr. Neustadt eindringlich wiederholt werden.

Reply No 1 sent on 20/01/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012

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Reply No 2 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
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- EASA will actively support initiatives enhancing interoperability of iConspicuity devices/systems.
- EASA will promote good practices in airspace design that reduce 'airspace complexity' and 'traffic congestion' with the aim to reduce the risk of collisions involving uncontrolled traffic.
- Member States will consider 'airspace complexity' and 'traffic congestion' as safety relevant factors in airspace changes affecting uncontrolled traffic, including the changes along international borders.
- EASA will ensure technical and operational compatibility of U-space and iConspicuity solutions.
- EASA will conduct a Safety Issue Assessment (SIA) of airspace infringements.
- EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.

Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-REDW	EUROCOPTER EC225	20 NM east of Aberdeen	10/05/2012	Accident

Registration	Aircraft Type	Location	Date of event	Event Type
G-CHCN	EUROCOPTER EC225	North Sea, 32nm southwest of Sumburgh	22/10/2012	Accident

Synopsis of the event:

While operating over the North Sea, in daylight, the crews of G-REDW and G-CHCN experienced a loss of main rotor gearbox oil pressure, which required them to activate the emergency lubrication system. This system uses a mixture of glycol and water to provide 30 minutes of alternative cooling and lubrication. Both helicopters should have been able to fly to the nearest airport; however, shortly after the system had activated, a warning illuminated indicating that the emergency lubrication system had failed. This required the crews to ditch their helicopters immediately in the North Sea. Both ditchings were successful and the crew and passengers evacuated into the helicopter's liferafts before being rescued. There were no serious injuries.

The loss of oil pressure on both helicopters was caused by a failure of the bevel gear vertical shaft in the main rotor gearbox, which drives the oil pumps. The shafts had failed as result of a circumferential fatigue crack in the area where the two parts of the shaft are welded together.

Safety Recommendation UNKG-2014-019:

Safety Recommendation UNKG-2014-019 (AAIB): It is recommended that the European Aviation Safety Agency commission research into the fatigue performance of components manufactured from high strength low alloy steel. An aim of the research should be the prediction of the reduction in service-life and fatigue strength as a consequence of small defects such as scratches and corrosion pits.

Reply No 1 sent on 01/08/2014: In 2012 EASA commissioned a research project, Engine Rotor Material Damage Tolerance (EROMDAT), addressing damage resistance and fatigue tests for high-strength materials used for engine rotating parts.

A final project meeting is planned with the engine manufacturers involved in the project in September 2014.

EASA will take the opportunity of this meeting to discuss with the participants about the applicability of proposed test methods on other metallic materials (low alloy steel) used for rotorcraft main gearbox design.

Reply No 2 sent on 22/03/2018: In the framework of rotorcraft design and certification activities there is an ongoing evaluation by Type Certificate Holders and EASA of the effect of corrosion on fatigue strength for high strength steels. This has already resulted in changes to the means provided by applicants to show compliance with CS 29.571 fatigue tolerance requirements.

Nonetheless, as further research in this field and other related areas is considered beneficial, the Agency has introduced the research project RES.008 "Rotorcraft main gear box (MGB) design to guarantee integrity of critical parts and system architecture to prevent separation of the main rotor following any MGB failure" in the European Plan for Aviation Safety (EPAS) 2018-2022.

One of the objectives of this research project is to understand threats to rotor drive system critical component integrity and methods to design and substantiate flaw tolerant critical component designs. This will include investigation of the effects of small defects including corrosion pits, dents and scratches.

Reply No 3 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has published the European Plan for Aviation Safety (EPAS) 2020-2024 which includes the research project RES.008 "Integrity improvement of rotorcraft main gear boxes (MGB)".

The main objectives of the research are the following:

1. Enhancement of new design features for helicopter MGB and attachments, to prohibit separation of the mast and main rotor from the helicopter at any time, and allow the helicopter to autorotate in case of any major failure of main gear box components.
2. Understand threats to the integrity of critical components in the rotor drive system and assess methods to design and substantiate the design of flaw-tolerant critical components.

The second objective will include investigation of the effects of small defects including scratches, dents and corrosion pits.

The final report is expected for Q1 2023.

Status: Open

France

Registration	Aircraft Type	Location	Date of event	Event Type
ASAGA STUDY				

Synopsis of the event:

Towards the end of the 2000's, the BEA observed that a number of public air transport accidents or serious incidents were caused by a problem relating to "aeroplane state awareness during go-around" (ASAGA), which may otherwise be described as a loss of control of the flight path during or at the end of a go-around manoeuvre (GA). Other events revealed inadequate management by the flight crew of the relationship between pitch attitude and thrust, with go-around mode not engaged, but with the aeroplane close to the ground and with the crew attempting to climb.
Moreover, these events seemed to have some common features, such as startle effect, the phenomenon of excessive preoccupation by at least one member of the crew, poor communication between crew members and difficulties in managing the automatic systems.
A study was thus initiated with a view to:

- Listing and analysing the factors common to these events.
- Suggesting strategies to prevent their recurrence.

Safety Recommendation FRAN-2013-032:

Safety Recommendation FRAN-2013-032 (BEA):
Le BEA recommande que l'AESA et les constructeurs d'aéronefs étudient l'efficacité de moyens permettant aux équipages de disposer d'une représentation synthétique de l'environnement extérieur en conditions IMC.

Reply No 1 sent on 13/08/2013: EASA acknowledges receipt of this Safety Recommendation. Please be advised that it is under consideration and that the outcome will be communicated to you in due course.

This reply gives the status within the 90 days period in compliance with Article 18 of Regulation (EU) No 996/2010.

Reply No 2 sent on 27/09/2013: The Agency, through Rulemaking Tasks RMT.0379 and RMT.0380 included in the rulemaking program, will review the airworthiness and Air Operations rules to enable the use of advanced vision systems (HUD, EVS, SVS, CVS) for

the benefit of increased situational awareness and operational credits. These tasks will take into account the established standards in the field of advanced vision systems the usage of which would improve the perception of the outside environment under poor visibility conditions.

The Agency is also aware of further study activities as regards the development of technology and the related standards in this area and will closely monitor these activities also at the level of ICAO and FAA and, hence, will plan subsequent rulemaking actions as applicable.

Already today, Commission Regulation (EU) No 965/2012 (Regulation Air Operations) does not limit the access to advanced vision systems for the purpose of enhancing the situational awareness.

Reply No 3 sent on 15/03/2016: The Agency, through Rulemaking Task RMT.0379 'All-weather operations', is reviewing the airworthiness and air operations rules to enable the use of advanced vision systems for the benefit of increased situational awareness and operational credits. Account is being taken of the established standards in the field of advanced vision systems [Minimum Aviation System Performance Standards (MASPS) published by the European Organisation for Civil Aviation Equipment (EUROCAE) and the Radio Technical Commission for Aeronautics (RTCA)] the usage of which would improve the perception of the outside environment under poor visibility conditions.

The RMT was launched on 09 December 2015 with the publication of the associated Terms of Reference. The planned deliverables, an EASA Opinion for Implementing Rules and a Notice of Proposed Amendment for Acceptable Means of Compliance and Guidance Material, are planned to be published by mid-2017.

It should be noted that, already today, Commission Regulation (EU) No 965/2012 on air operations does not preclude access to advanced vision systems for the purpose of enhancing situational awareness.

Reply No 4 sent on 30/04/2020: There is no equipment available for virtual representation of the outside environment in Instrument Meteorological Conditions (IMC), but deployment of systems relying on augmented reality approaches is being considered by the European Union Aviation Safety Agency (EASA) within the context of Rulemaking Task RMT.0379 'All-weather operations'.

Under RMT.0379, EASA is reviewing the airworthiness and air operations rules to enable the use of advanced vision systems for the benefit of increased situational awareness and operational credits. Account is being taken of the established standards in the field of advanced vision systems [Minimum Aviation System Performance Standards (MASPS) published by the European Organisation for Civil Aviation Equipment (EUROCAE) and the Radio Technical Commission for Aeronautics (RTCA)], the usage of which would improve the perception of the outside environment under poor visibility conditions.

EASA has published Notice of Proposed Amendment NPA 2018-06 related to RMT.0379 (13 July 2018). The next RMT deliverable, an EASA Opinion, is planned to be published in 2020 Q3 [see the European Plan for Aviation Safety (EPAS 2020-2024)].

It should be noted that, already today, Commission Regulation (EU) No 965/2012 on air operations does not preclude access to advanced vision systems for the purpose of enhancing situational awareness.

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
EC-FPD	MCDONNELL DOUGLAS MD88	Vienna Schwechat Airport (LOWW)	31/07/2008	Serious incident

Synopsis of the event:

The MD 88 aircraft took off from the Vienna Schwechat airport for Madrid on 31.07.2008 at 17:34 UTC. During the take-off run immediately before becoming airborne, the left engine experienced loss of power and vibration, as well as a smell of burning, upon which the pilots shut the engine off. The pilots returned to the airport and landed at 18:50.
The aircraft was able to leave the runway under its own power.
The incident did not cause any personal injury, but the aircraft was seriously damaged.
The investigations by the Aviation Safety Investigation Authority showed that the unsecured valve stem on the rim of tyre 2 has worked loose and the O-ring underneath was torn apart, which had the effect of deflating the tyre. As a result, during the take-off run and past the point of decision, the tread of the tyre broke away, breaking off part of the water deflector attached to the left engine. The landing gear well was damaged, and then parts of the tread were thrown into the left engine, which caused loss of power and vibration, after which the engine was shut down.

Safety Recommendation Aust-2013-008:

Safety Recommendation AUST-2013-008: EASA, FAA:
Supplement to Certification Specifications 25 (CS-25), pressure displays of landing gear tyres: Insufficient pressure in landing gear tyres can, as happened in this serious incident, cause massive damage to the aircraft and result in flight situations with increased risk. On this topic also see, for example, the accident report issued by the US National Transportation Safety Board (NTSB): Runway Overrun During Rejected Takeoff, Global Exec Aviation, Bombardier Learjet 60, N999LJ, Columbia, South Carolina, September 19, 2008, http://www.ntsb.gov/doclib/reports/2010/aar1002.pdf.
CS-25 should be revised to specify installation of pressure indicators for all landing gear tyres in the cockpit of commercial aircraft.

Reply No 1 sent on 19/02/2014: EASA acknowledges receipt of this Safety Recommendation. Please be advised that it is under consideration and that the outcome will be communicated to you in due course.

This reply gives the status within the 90 days period in compliance with Article 18 of Regulation (EU) No 996/2010.

Reply No 2 sent on 05/06/2014: The Agency recognizes the importance of ensuring that tyres remain correctly inflated within the pressure specifications defined by the aircraft manufacturer.

The Agency acknowledges that rulemaking to review and improve, as far as possible, current regulations enforcing tyre inflation requirements could contribute to mitigating the identified risk. The installation of tyre pressure monitoring systems can mitigate the cases escaping current safety barriers (e.g. air leakage in the tyre/wheel assembly, maintenance error or negligence, failure/inaccuracy of the inflation equipment, operator not correctly performing the regular checks, etc.).

The Agency considers implementing a new task in the rulemaking programme, and an updated response will be provided when the decision has been taken.

Please note that CS-25 was also recently amended to upgrade large aeroplane certification standards for protection against the effects of tyre and wheel failures (which includes the threat from under-inflated tyres).

Reply No 3 sent on 07/07/2017: With the amendment 14 of CS-25 (effective on 20 December 2013, applicable to new certification projects of large aeroplanes), the Agency introduced new certification specifications to upgrade the protection against the damaging effects of tyre and wheel failures.

However, the Agency has initiated a new rulemaking task, RMT.0586, to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer.
The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA Website: https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

Mandating the installation of a tyre pressure monitoring system is one of the elements to be considered among the objectives of RMT.0586.

The next step of RMT.0586 is the publication of a Notice of Proposed Amendment (NPA) which is envisaged during 03Q2018.

Reply No 4 sent on 22/06/2020: With amendment 14 of CS-25 (Certification specifications and acceptable means of compliance for large aeroplanes) (effective as of 20 December 2013, applicable to new certification projects of large aeroplanes), EASA introduced new certification specifications to upgrade protection against the damaging effects of tyre and wheel failures.

After that, EASA initiated rulemaking task RMT.0586 to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer. The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA website:
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

This safety recommendation has been taken into account in this rulemaking task. Notice of Proposed Amendment (NPA) 2020-05 ('Tyre pressure monitoring') was published for consultation on 6 March 2020:
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-05

This NPA includes a proposal to amend CS-25 to require applicants to provide a means to ensure that no tyre is below its minimum serviceable inflation pressure during operation. This can be achieved either by providing a task in the instructions for continued airworthiness (ICA) that requires operators to perform tyre pressure checks at a suitable time interval (i.e. daily or at another substantiated interval), or by installing a tyre pressure monitoring system that alerts the flight crew in the case of a tyre with an unsafe pressure. The related EASA Decision is scheduled for Q1/2021.

Reply No 5 sent on 03/03/2021: With amendment 14 of certification specification CS-25 (effective on 20 December 2013, applicable to new certification projects of large aeroplanes), EASA introduced new certification specifications to upgrade the protection against the damaging effects of tyre and wheel failures.

After that, the European Union Aviation Safety Agency (EASA) initiated rulemaking task RMT.0586 to propose a regulatory change to better ensure that the inflation pressures of tyres of large aeroplanes remain within the pressure specifications defined by the aeroplane manufacturer.
The terms of reference and the rulemaking group composition were published on 30 May 2017 on the EASA website:
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0586

This safety recommendation has been taken into account in this rulemaking task.
Notice of Proposed Amendment (NPA) 2020-05 ('Tyre pressure monitoring') was published for consultation on 6 March 2020:
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-05

Executive Director (ED) Decision 2020/024/R on amendment 26 of CS-25 was published on 22 December 2020.
https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2020024r
A new objective based certification specification CS 25.733(f) has been created to require that the applicant provides a means to minimise the risk that a tyre is below its minimum

serviceable inflation pressure during operation. The corresponding new AMC 25.733(f) indicates how the applicant can demonstrate compliance.

These new provisions are not prescriptive and do not universally mandate the installation of a system indicating the tyre inflation pressures in the cockpit. The applicant should use one, or a combination, of the following means:
(a) Provide a task in the Instructions for Continued Airworthiness (ICA) that requires tyres inflation pressure checks to be performed at a suitable time interval,
(b) Install a system that monitors the tyres inflation pressures and:
(1) provides an alert to the flight crew, in compliance with CS 25.1322, whenever a tyre inflation pressure is below the minimum serviceable inflation pressure, or
(2) allows the tyres inflation pressures to be checked prior to the dispatch of the aeroplane, and a tyre inflation pressure check task is included in the Aeroplane Flight Manual (AFM) pre-flight procedures.

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
N738W	CESSNA 414	Ellbögen,Bezirk Innsbruck Land, Tirol	30/09/2012	Accident

Synopsis of the event:

Am Unfalltag startete der Pilot mit sieben Passagieren vom Flughafen Innsbruck zu einem Sichtflug nach Valencia. Am Flughafen Innsbruck herrschten Sichtflugwetterbedingungen. Nach dem Start auf der Piste 26 flog der Pilot in einen linken Gegenabflug und anschließend in das Wipptal Richtung Brennerpass ein. Im Gemeindegebiet von Ellbögen kollidierte das Luftfahrzeug in dichtem Nebel mit ansteigendem Gelände. Es brach ein Brand aus. Der Pilot und fünf Passagiere erlitten tödliche Verletzungen, zwei Passagiere wurden schwer verletzt. Das Luftfahrzeug wurde zerstört.
Die Untersuchungen ergaben, dass der Pilot im Besitz eines gültigen Privatpilotenscheines ohne Instrumentenflugberechtigung war. Das Luftfahrzeug wurde nicht im Rahmen eines Luftverkehrsbetreiberzeugnisses betrieben. Der Flug war entgeltlich und der Pilot war in Instrumentenflugwetterbedingungen eingeflogen.
Trotz umfangreicher und detaillierter Untersuchungen wurden keinerlei Hinweise auf vorbestandene unfallkausale technische Mängel festgestellt.

Safety Recommendation Aust-2015-003:

Safety Recommendation AUST-2015-003:
Ergreifung von Maßnahmen die sicherstellen, dass Signale von Notsendern nach unfallbedingten Aufschlägen von Luftfahrzeugen auch empfangen werden können:
Beim gegenständlichen Aufschlag des Luftfahrzeuges an der Unfallstelle wurde der Notsender aktiviert und sendete bis zu seinem Abschalten über einen Zeitraum von 52 Stunden Notsignale. Da aber die beiden, links und rechts neben der Seitenflossenstrake angebrachten Stabantennen unfallbedingt abbrachen, waren die ausgesendeten Signale so schwach, dass sie nur im Umkreis von einigen Metern empfangen hätten werden können. Da jedoch dieser Unfall zufälligerweise von Ohrenzeugen in alpinem Gelände beobachtet wurde, konnte derUnfallort lokalisiert und die schwer verletzten Überlebenden gerettet werden. Auf Grund der Wetterlage hätten Suchflüge das Wrack weder visuell und auf Grund der abgebrochenen Notsenderantennen auch nicht elektronisch orten können. Bei unfallbedingten Aufschlägen von Luftfahrzeugen wird oftmals die Verbindung zwischen Notsender und Notsenderantenne(n) unterbrochen oder brechen, wie im gegenständlichen Fall herkömmliche Notsenderstabantennen ab. Damit können die von den aber noch intakten Notsendern ausgesendeten Signale von den dafür vorgesehenen Stellen nicht mehr empfangen werden. Auf diesen Umstand weist die SUB/ZLF im Zuge der Untersuchung von Flugunfällen seit Jahren hin. Da nach unfallbedingten Aufschlägen von Luftfahrzeugen Signale von Notsendern von den dafür vorgesehenen Stellen oftmals nicht empfangen werden können, soll die EASA geeignete Maßnahmen setzen die nach

Flugunfällen die Aussendung von brauchbaren Notsignalen von Notsendern verbessern, (durch Verwendung von Antennen, die möglichen Unfällen besser standhalten können; durch Einführung von automatisch aktivierten Notsendern, die bereits vor dem Aufschlag Notsignale senden; etc.). Durch die lange Lebensdauer von Luftfahrzeugen sollen dabei auch Maßnahmen gesetzt werden, die nach Flugunfällen die Aussendung von brauchbaren Notsignalen bereits zertifizierter und in Betrieb befindlicher Luftfahrzeuge verbessern, (durch Verwendung von Antennen, die möglichen Unfällen besser standhalten können; etc.)

Reply No 1 sent on 02/06/2015: Broken emergency locator transmitter (ELT) antennas are known to be one of the issues preventing correct operation of ELT following an accident. EASA has been actively working to improve the robustness of the antenna and of the antenna installation (as well as more generally to improve the installation of the ELT system). To that end, EASA is preparing a Certification Memorandum (CM) that provides guidance for the installation of ELTs and recommendations for the maintenance procedures that improves the reliability of ELTs. This CM deals with those issues related to the installation and maintenance of the system that are out of the scope of the European Technical Standard Order (ETSO) approval and are specific to the installation on the aircraft, mainly for helicopters and general aviation aeroplanes.

In addition, EASA is participating in and supporting the joint EUROCAE WG98/RTCA SC-229, which aims at releasing an improved ED-62B/DO-204B by 2017, which will result in an improved ETSO. Among the tasks of this joint working group is the improvement of the robustness to crash, through more stringent testing and improved installation recommendations.

The WG98 is also developing criteria for the automatic transmission when flight parameters permit to anticipate an imminent crash, as suggested in the recommendation. This would permit to transmit the alert before the crash environment alters the beacon performance. This is primarily indented for large aircraft flying over remote areas. EASA closely monitors this subject, in coordination with ICAO.

Reply No 2 sent on 28/09/2018: Broken emergency locator transmitter (ELT) antennas are known to be one of the issues preventing correct operation of ELT following an accident.

On 12th December 2016, EASA published the Certification Memorandum (CM) "Installation of ELTs" (CM-AS-008), which provides guidance for the installation of ELTs and recommendations for the maintenance procedures to improve the reliability of ELTs. This CM deals with those issues related to the installation and maintenance of the system that are out of the scope of the European Technical Standard Order ETSO-C126b "406 and 121.5 MHz Emergency Locator Transmitter" approval, and are specific to the installation on the aircraft, mainly for helicopters and general aviation aeroplanes.

In addition, EASA is participating in and supporting the joint EUROCAE WG98/RTCA SC-229, which aims at improving ED-62B/DO-204B "Minimum Operational Performance Specification for Aircraft Emergency Locator Transmitters 406 MHz and 121.5 MHz (Optional 243 MHz)". Among the tasks of this joint working group is the improvement of the robustness to crash, through more stringent testing, and improved installation recommendations. This will trigger the amendment of ETSO-C126c, which is expected to be published as part of Rulemaking Task RMT.0457 (regular update of CS-ETSO) by mid-2019.

The same EUROCAE group produced ED-237 "Minimum Aviation System Performance Specification For Criteria To Detect In-Flight Aircraft Distress Events To Trigger Transmission Of Flight Information", which was published on 1st February 2016 and contains criteria for the automatic transmission when flight parameters permit to anticipate an imminent crash. This will allow transmission of an alert before the crash environment alters the beacon performance.

Reply No 3 sent on 22/09/2020: The European Union Aviation Safety Agency (EASA) has taken the following actions to improve the availability of the alerting signal transmitted by Emergency Locator Transmitters (ELTs):

- European Technical Standard Order - ETSO-C126b ('406 and 121.5 MHz Emergency Locator Transmitter') was issued in August 2016. In this ETSO, hook and loop fasteners are excluded from the acceptable means to attach the ELT in the aircraft, because it is a known weak point of the ELT installation. The ETSO can be found at https://www.easa.europa.eu/easa-and-you/aircraft-products/etso-authorisations/list-of-current-etso

- EASA published a Certification Memorandum (CM) on 'Installation of ELTs' (EASA CM–AS-008 Issue 01) in December 2016. This CM provides guidance for the installation of ELTs and recommendations for the maintenance procedures that might improve the reliability of ELTs: https://www.easa.europa.eu/document-library/public-consultations/certification-memoranda

- EASA participated in the joint RTCA Special Committee 229/EUROCAE Working Group 98 which prepared an update of the ELT minimum operational performance specifications (MOPS) DO-204A/ED-62A which included the following items:
• Improved antenna and cabling specifications,
• Crash safety specifications,
• So called 'second generation ELT' which use the Medium Earth Orbit Search And Rescue constellation (MEOSAR) providing instantaneous detection and location of the beacon.

ED-62B was issued in December 2018.

- EASA published Executive Director (ED) Decision 2020/011/R on 23 July 2020 amending CS-ETSO (Amendment 16). This amendment introduces a revision of ETSO-C126b, i.e. ETSO-C126c, which incorporates ED-62B 'MOPS for Aircraft Emergency

Locator Transmitters 406 MHz' as a minimum performance standard (including Change 1 clarification dated 16 June 2020).
https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2020011r

- EASA published on 17 June 2019 Safety Information Bulletin (SIB) 2019-09 entitled Emergency Locator Transmitters and Personal Locator Beacons (PBL) - Annual Testing. This SIB provides recommendations to operators to perform ELT and PBL annual test and inspection.

- CS-27 and CS-29 amendments 5, issued on 25 June 2018, introduced new CS 27/29.1470 specifications requiring ELTs to be installed so as to minimise damage that would prevent its functioning following an accident or incident. AMC 27/29.1470 provides acceptable means to show compliance with these requirements.
https://www.easa.europa.eu/document-library/certification-specifications/cs-27-amendment-5
https://www.easa.europa.eu/document-library/certification-specifications/cs-29-amendment-5

- Additionally, in order to promote the installation of ELT within the General Aviation community, EASA allows the installation of ELTs in aircraft with a simplified process through the use of a dedicated Standard Change. Refer to CS-SC101b in CS-STAN Issue 2: https://www.easa.europa.eu/document-library/certification-specifications/cs-stan-issue-2

Lastly, as side information, EASA has also produced safety promotion material to promote the proper registration and testing of ELTs:
https://www.easa.europa.eu/newsroom-and-events/news/sunny-swift-emergency-locator-transmitters

Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
D-HLOG XX-XXXX	AEROSPATIALE AS332DIAMOND DV20	Flugplatz Zell am See, Austria	05/03/2007	Accident

Synopsis of the event:

Der Zusammenstoß eines Motorflugzeugs der Type DV 20 „Katana" mit einem Hubschrauber der Type AS 332 „Super-Puma" ereignete sich um 09:53 Uhr, ca 1 NM NW des Flugplatzes Zell am See (LOWZ), als der Hubschrauber auf dem Weg von Kaprun Richtung Berchtesgaden den Flugplatzbereich in Richtung NNE überquerte. Dabei kreuzten einander die Flugwege des Hubschraubers und des Motorflugzeugs entlang der Platzrunde über dem Südosthang der Schmittenhöhe.
Das Motorflugzeug war zum Zeitpunkt des Zusammenstoßes im Steigflug, der Hubschrauber befand sich kurz nach dem Übergang vom Steigflug in den Horizontalflug.

Als Unfallursachen konnten Sichtbehinderungen und komplexe psychologische Faktoren der Piloten der beiden Luftfahrzeuge ermittelt werden, die das Erkennen des jeweils anderen Luftfahrzeugs und ein rechtzeitiges Ausweichen verhindert haben.

Safety Recommendation Aust-2008-002:

Die Empfehlungen aus früheren Untersuchungen der UUB (bzw der FUS) zu einer Verwendung von Zusammenstoßwarngeräten muss nach diesem Zusammenstoß und einem ähnlichen im November 2006 in der Nähe von Wr. Neustadt eindringlich wiederholt werden. So sollten seitens der EASA die Voraussetzungen für die Entwicklung von Vorschriften hinsichtlich Technik, Einbau und Zertifizierung von kostengünstigen Zusammenstoßwarngeräten für die Allgemeine Luftfahrt geschaffen werden. Es sollte auch eine mögliche Subventionierung von Zusammenstoßwarngeräten überlegt werden (Aero-Club, Steuerbefreiung usw). Welches der verfügbaren (auf gegenseitiger Funkabfrage bzw auf Transpondererkennung basierend) oder der in Erprobung befindlichen Systeme (satellitengestützte Verarbeitung von Transpondersignalen, ADS-B, bzw RFID- Technologie in Verbindung mit GPS) zum Einsatz kommen sollen, wird noch zu diskutieren sein. Testflüge mit allen derzeit erhältlichen Systemen durch die UUB haben jedenfalls eindrücklich die Wirksamkeit solcher Systeme bestätigt. (SE/UUB/LF/02/2008)

Reply No 1 sent on 06/06/2011: EASA acknowledges receipt of this Safety Recommendation. Please be advised that it is under consideration and that the outcome will be communicated to you in due course.

Reply No 2 sent on 05/12/2011: The Agency agrees to study rulemaking options for cost-efficient collision warning systems. Rulemaking tasks RMT.0436 and RMT.0437 [former Multi Disciplinary Measures MDM.049(a) and (b)] 'Standards and implementation of collision warning systems in the field of general aviation due to increasing number of near misses and mid-air collisions' are part of the Agency's Rulemaking Programme inventory.

Reply No 3 sent on 08/09/2016: The European Aviation Safety Plan 2011-2014 (https://www.easa.europa.eu/system/files/dfu/sms-docs-European-Aviation-Safety-Plan--(EASp)-2011-2014-v1.2.pdf) already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in P21 A.90B of Commission Regulation (EU) 748/2012 (https://www.easa.europa.eu/system/files/dfu/Annex%20IV%20to%20EDD%202015-016-R.pdf, refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all these solutions.

The Network of Analysts whose role is formalised by Regulation (EU) 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, performed a study, on Mid-air collision/Near mid-air collision (MAC/NMAC). According to that study MACs/NMACs contributed to 2% of the fatalities in the 2012-2014 period: the largest amount of fatalities involved loss of control (23%) or controlled flight into terrain (15%). EASA recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020 (https://www.easa.europa.eu/system/files/dfu/EPAS%202016-2020%20FINAL.PDF), is further addressing the issue under the umbrella of the safety topic "general aviation safety".

EASA will continue to report progress on this safety topic in the frame of the European Plan for Aviation Safety.

Reply No 4 sent on 28/04/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012

(refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015, CS-SC058a in CS-STAN Issue 2 dated 30 March 2017) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all of these solutions.

According to the EASA Annual Safety Review 2016, MACs contributed to 6% of the fatalities in the 2006-2015 period in Non-Commercial operations with aeroplanes. The related fatalities mainly involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid" principles, should be reinforced. Cost-efficient electronic conspicuity devices can be one contributor.

The European Plan for Aviation Safety (EPAS) 2016-2020 already addressed the issue under the umbrella of the safety topic "general aviation safety". The current version of the plan, (EPAS 2017-2021) includes further actions for MAC/NMAC in general aviation, under the strategic safety area "General Aviation - Preventing mid-air collisions".

Reply No 5 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
Before initiating RMT.0376, EASA undertook a detailed review and assessment of the airborne collision risk. The outcome of the assessment was summarised in a Best Intervention Strategy (BIS) that has been validated through a survey and a stakeholders' consultation.
The BIS concluded that a broader use of iConspicuity solutions and improvement of their interoperability together with a better airspace utilisation and design, while ensuring compatibility with U-space regulatory framework, should be at the heart of the future actions.
iConspicuity (or in-flight electronic conspicuity plus) means in-flight capability to transmit position of aircraft and/or to receive, process and display positions of other aircraft in a real time with the objective to enhance pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, regardless whether airborne or on the ground, that can help airspace users and other affected stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.
Therefore EASA decided that RMT.0376 will be removed from the EPAS and replaced by a strategy composed of a set of EPAS tasks compounded of existing rulemaking tasks which will be implemented through new safety promotion (SPT), research (RES) and member state tasks (MST). The best safety benefits are expected to be achieved through synergies of all proposed actions, while utilising the U-space regulatory framework as a catalyst for safety improvements.
The following bullet points summarize the collective actions which will be implemented for Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers:

• EASA, with support of technical partners, will demonstrate and validate feasibility of achieving interoperability of different iConspicuity devices/systems through network of stations while respecting data privacy requirements.
• EASA will analyse 'Net Safety Benefit' and 'Operational Safety Assessment' concepts for the use of iConspicuity devices/systems in Flight Information Services.
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• EASA will actively support initiatives enhancing interoperability of iConspicuity devices/systems.
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• Member States will consider 'airspace complexity' and 'traffic congestion' as safety relevant factors in airspace changes affecting uncontrolled traffic, including the changes along international borders.
• EASA will ensure technical and operational compatibility of U-space and iConspicuity solutions.
• EASA will conduct a Safety Issue Assessment (SIA) of airspace infringements.
• EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.
Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-GHSH BGA4926	PIPER PA25SLINGSBY T31	Close to Buno-Bonnevaux Airport	05/05/2012	Accident

Synopsis of the event:

Vers 16 h 45, le pilote du PA25 décolle en piste 28 de l'aérodrome de Buno-Bonnevaux en remorquant un planeur. A l'issue du largage, il entame une descente continue en direction de l'aérodrome pour y atterrir. Vers 16 h 50, passant le travers sud du seuil de piste 10, à une hauteur d'environ 100 mètres au-dessus d'un bois, l'avion entre en collision avec un autre planeur. Ce dernier avait décollé de la piste 28, à l'aide d'un treuil, quelques minutes plus tôt.

Safety Recommendation FRAN-2015-057:

L'AESA favorise l'apparition, l'utilisation et la généralisation de systèmes interopérables d'aide à la détection de trafic. Cela peut notamment passer par la standardisation de formats de sortie et d'échange entre les différents systèmes.

Reply No 1 sent on 18/12/2015: A study entitled 'Scoping Improvements to 'See And Avoid' for General Aviation (SISA)' was conducted on behalf of EASA. The report dated 01/12/2012 is available on the EASA website under the reference EASA.2011.07 at https://www.easa.europa.eu/document-library/research-projects

The aim of the study was to investigate potential improvements regarding the 'see-and-avoid' principle. The study concluded that there is currently no solution available that mitigates all of the issues related to See and Avoid. See and Avoid training and education, although remaining a top priority, could however be complemented by on-board equipment. Several systems are already widely used and provide help to the pilot to identify other traffic. It also concluded that 'any on-board equipment to augment the pilot's visual observations shall be light, low cost, and cooperative.'

The Agency has encouraged the installation of one of these widely used General Aviation anti-collision awareness systems, FLARM, by making this system available as a Standard Change (refer to CS-SC051a in CS-STAN Issue 1 dated 8 July 2015). The availability as Standard Change avoids the substantial increase in cost that is generated by the usual certification process.

The low cost and simple installation of the system makes the FLARM system widely adopted in Europe and contributes to the principle proposed by this safety recommendation.

The Agency continuously monitors the development of new technological solutions. For example, newer FLARM devices are based on a technology that also incorporates an ADS-B and transponder (SSR) Mode-C/S receiver. Furthermore, SESAR (Single European Sky ATM Research) is also carrying out research on affordable alternative surveillance systems for general aviation. Such systems would display warnings of proximate traffic fitted with ADS-B, transponder (SSR) Mode-C/S receiver or FLARM.

Reply No 2 sent on 28/04/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015, CS-SC058a in CS-STAN Issue 2 dated 30 March 2017) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all of these solutions.

According to the EASA Annual Safety Review 2016, MACs contributed to 6% of the fatalities in the 2006-2015 period in Non-Commercial operations with aeroplanes. The related fatalities mainly involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid" principles, should be reinforced. Cost-efficient electronic conspicuity devices can be one contributor.

The European Plan for Aviation Safety (EPAS) 2016-2020 already addressed the issue under the umbrella of the safety topic "general aviation safety". The current version of the plan, (EPAS 2017-2021) includes further actions for MAC/NMAC in general aviation, under the strategic safety area "General Aviation - Preventing mid-air collisions".

Reply No 3 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
Before initiating RMT.0376, EASA undertook a detailed review and assessment of the airborne collision risk. The outcome of the assessment was summarised in a Best Intervention Strategy (BIS) that has been validated through a survey and a stakeholders' consultation.

The BIS concluded that a broader use of iConspicuity solutions and improvement of their interoperability together with a better airspace utilisation and design, while ensuring compatibility with U-space regulatory framework, should be at the heart of the future actions.
iConspicuity (or in-flight electronic conspicuity plus) means in-flight capability to transmit position of aircraft and/or to receive, process and display positions of other aircraft in a real time with the objective to enhance pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, regardless whether airborne or on the ground, that can help airspace users and other affected stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.
Therefore EASA decided that RMT.0376 will be removed from the EPAS and replaced by a strategy composed of a set of EPAS tasks compounded of existing rulemaking tasks which will be implemented through new safety promotion (SPT), research (RES) and member state tasks (MST). The best safety benefits are expected to be achieved through synergies of all proposed actions, while utilising the U-space regulatory framework as a catalyst for safety improvements.
The following bullet points summarize the collective actions which will be implemented for Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers:
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• EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.
Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-BXIU G-DANT	OTHER Generic (Reims Aviation F172)COMMANDER 114	St. Martin de Brethencourt	08/09/2009	Accident

Synopsis of the event:

Le pilote du F 172 immatriculé F-BXIU décolle de l'aérodrome de Toussus-le-Noble (78) à 12 h 15 pour un vol local en instruction. Lors de ce vol de début de formation, l'instructeur et l'élève effectuent divers exercices de maniabilité, à altitude sensiblement constante. Ils ne sont pas en contact avec un organisme de la circulation aérienne au moment de l'accident. Le code transpondeur affiché est 7000 avec le mode C.

Le pilote du Commander 114 immatriculé G-DANT décolle de l'aérodrome de Montbéliard (25) à destination de l'aérodrome de Lognes (77) où il atterrit en milieu de journée. Un passager le rejoint et, après un repas rapide, ils décollent à 12 h 12 à destination de Dinard (35). Le pilote se dirige vers le sud en direction de Melun (77) puis s'établit sur une trajectoire rectiligne au cap 260 en direction de Chartres (28), à une vitesse sensiblement constante de 100 kt et à une altitude stable de 1 500 pieds QNH. Le pilote est en contact avec le CIV Paris Info avec le code 7010 affiché au transpondeur (mode C en panne).
A 12 h 40, les deux avions entrent en collision en vol au dessus de la commune de Saint-Martin-de-Bréthencourt (78):

- le F 172 perd une partie de l'aile droite, heurte le sol à quelques centaines de mètres du lieu de la collision en vol et prend feu ;
- le pilote du Commander 114 conserve le contrôle de son avion, se déclare en détresse sur la fréquence et annonce avoir heurté « un ULM ou quelque chose comme ça ». Il atterrit dans un champ situé sur la commune de Boinville-le-Gaillard (78), à environ trois kilomètres du lieu de la collision en vol.

Safety Recommendation FRAN-2016-100:

Le BEA renouvelle sa recommandation auprès de l'AESA afin d'accélérer l'évaluation des différents systèmes d'aide à la détection de trafics existants et d'assurer la promotion de leur déploiement dans le domaine de l'aviation générale.

Reply No 1 sent on 27/04/2016: EASA is investigating on the issue of mid-air collisions in the field of general aviation has supported a study entitled "Scoping Improvements to 'See And Avoid' for General Aviation (SISA)". The report dated 01/12/12 is available on the EASA Website under the reference EASA.2011.07: https://www.easa.europa.eu/document-library/research-projects.

The study concluded that 'any on-board equipment to augment the pilot's visual observations shall be light, low cost, and cooperative (non-cooperative will be too expensive)'. It therefore recommended to develop a technical standard for collision warning systems in the field of general aviation and Identified EUROCAE as the standardisation body.

Several systems are already widely used and provide help to the pilot to identify other traffic. EASA has already encouraged the installation of one of these systems (FLARM), by making this system available as a Standard Change (refer to CS-SC051a in CS-STAN Issue 1 dated 8 July 2015)).

EASA continuously monitors the development of new technological solutions and has started a further internal investigation, which will examine all possible actions to reduce the number of airprox and of mid-air collisions in the uncontrolled European airspace.

Reply No 2 sent on 28/04/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015, CS-SC058a in CS-STAN Issue 2 dated 30 March 2017) and installation approvals of this type of devices.

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According to the EASA Annual Safety Review 2016, MACs contributed to 6% of the fatalities in the 2006-2015 period in Non-Commercial operations with aeroplanes. The related fatalities mainly involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid" principles, should be reinforced. Cost-efficient electronic conspicuity devices can be one contributor.

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• EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.

Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
HB-3373 **HB-DFP**	SCHEMPP HIRTH VENTUS2BMOONEY M20J	Approx. 8 km WSW of Airfield Birrfeld (LSZF)	06/06/2013	Accident

Synopsis of the event:

L'accident est dû à la collision entre un planeur et un avion à moteur parce que les deux équipages ont surveillé l'espace aérien de façon trop peu active. Par conséquent, le planeur est devenu incontrôlable et s'est écrasé.

Les facteurs suivants ont été déterminés comme systémiques :

- l'avion à moteur n'était pas équipé d'un système d'alerte de collision ;
- les signaux émis par le transpondeur de l'avion à moteur n'ont pas pu être reçus par le système d'alerte de collision du planeur.

Safety Recommendation SWTZ-2016-002:

Das Bundesamt für Zivilluftfahrt (BAZL) sollte in Zusammenarbeit mit den Anspruchsgruppen und der Europäischen Agentur für Flugsicherheit (EASA) ein Konzept für die Einführung von kompatiblen, auf Standards der Internationalen Zivilluftfahrt basierenden Kollisionswarnsystemen für die allgemeine Luftfahrterarbeiten und einen Aktionsplan für die kurz-, mittel- und langfristige Umsetzung erstellen und umsetzen. [Sicherheitsempfehlung Nr. 499]

Reply No 1 sent on 27/04/2016: EASA is investigating on the issue of mid-air collisions in the field of general aviation has supported a study entitled "Scoping Improvements to 'See And Avoid' for General Aviation (SISA)". The report dated 01/12/12 is available on the EASA Website under the reference EASA.2011.07: https://www.easa.europa.eu/document-library/research-projects.

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Reply No 2 sent on 28/04/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015, CS-SC058a in CS-STAN Issue 2 dated 30 March 2017) and installation approvals of this type of devices.

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Status: Closed

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
OE-VPU **OE-XHT**	DIAMOND DA42ROBINSON R44	near Katzelsdorf	14/11/2006	Accident

Synopsis of the event:

Pilot A startete am 14.11.2006, um 12:08 Uhr alleine als verantwortlicher Pilot mit dem Flugzeug A nach Sichtflugregeln am Flugplatz Wr. Neustadt-Ost (LOAN) mit dem Flugziel Flughafen Graz-Thalerhof (LOWG).
Zur gleichen Zeit flog Pilot B alleine als verantwortlicher Pilot mit dem Hubschrauber B nach Sichtflugregeln vom Flugplatz Trieben (LOGI) kommend zum Flugplatz Wr. Neustadt-Ost (LOAN).
Flugzeug A kurvte vom Meldepunkt GOLF kommend im Steigflug nach rechts auf südwestlichen Kurs, Hubschrauber B kurvte im Horizontalflug nach links auf nordöstlichen Kurs. Gegen 12:12 Uhr kollidierten die beiden Luftfahrzeuge ca. 2,1 km südwestlich von Meldepunkt GOLF des Flugplatzes Wr. Neustadt-Ost in ca. 1800-1900 ft MSL und stürzten ab.
Beide Piloten erlitten tödliche Verletzungen. Beide Luftfahrzeuge wurden zerstört.
Der Zusammenstoß ist auf das für ein Ausweichen der Luftfahrzeuge zu spätes Erkennen der Zusammenstoßgefahr zurückzuführen.

Safety Recommendation AUST-2016-001:

Safety Recommendation AUST-2016-001:
Die Empfehlungen aus früheren Untersuchungen der UUB (bzw der FUS) zu einer Verwendung von Zusammenstoßwarngeräten muss nach diesem Zusammenstoß und einem ähnlichen im November 2006 in der Nähe von Wr. Neustadt eindringlich wiederholt werden.
So sollten seitens der EASA die Voraussetzungen für die Entwicklung von Vorschriften hinsichtlich Technik, Einbau und Zertifizierung von kostengünstigen Zusammenstoßwarngeräten für die Allgemeine Luftfahrt geschaffen werden.
Es sollte auch eine mögliche Subventionierung von Zusammenstoßwarngeräten überlegt werden (Aero-Club, Steuerbefreiung usw).
Welches der verfügbaren (auf gegenseitiger Funkabfrage bzw auf Transpondererkennung basierend) oder der in Erprobung befindlichen Systeme (satellitengestützte Verarbeitung von Transpondersignalen, ADS-B, bzw RFID-Technologie in Verbindung mit GPS) zum Einsatz kommen sollen, wird noch zu diskutieren sein.
Testflüge mit allen derzeit erhältlichen Systemen durch die UUB haben jedenfalls eindrücklich die Wirksamkeit solcher Systeme bestätigt.

Reply No 1 sent on 08/09/2016: The European Aviation Safety Plan 2011-2014 (https://www.easa.europa.eu/system/files/dfu/sms-docs-European-Aviation-Safety-Plan--(EASp)-2011-2014-v1.2.pdf) already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in P21 A.90B of Commission Regulation (EU) 748/2012 (https://www.easa.europa.eu/system/files/dfu/Annex%20IV%20to%20EDD%202015-016-R.pdf, refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all these solutions.

The Network of Analysts whose role is formalised by Regulation (EU) 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, performed a study, on Mid-air collision/Near mid-air collision (MAC/NMAC). According to that study MACs/NMACs contributed to 2% of the fatalities in the 2012-2014 period: the largest amount of fatalities involved loss of control (23%) or controlled flight into terrain (15%). EASA recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020 (https://www.easa.europa.eu/system/files/dfu/EPAS%202016-2020%20FINAL.PDF), is further addressing the issue under the umbrella of the safety topic "general aviation safety".

EASA will continue to report progress on this safety topic in the frame of the European Plan for Aviation Safety.

Reply No 2 sent on 28/04/2017: The European Aviation Safety Plan 2011-2014 already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015, CS-SC058a in CS-STAN Issue 2 dated 30 March 2017) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all of these solutions.

According to the EASA Annual Safety Review 2016, MACs contributed to 6% of the fatalities in the 2006-2015 period in Non-Commercial operations with aeroplanes. The related fatalities mainly involved loss of control (47%) or controlled flight into terrain (15%). The Agency recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid" principles, should be reinforced. Cost-efficient electronic conspicuity devices can be one contributor.

The European Plan for Aviation Safety (EPAS) 2016-2020 already addressed the issue under the umbrella of the safety topic "general aviation safety". The current version of the plan, (EPAS 2017-2021) includes further actions for MAC/NMAC in general aviation, under the strategic safety area "General Aviation - Preventing mid-air collisions".

Reply No 3 sent on 14/12/2020: The European Plan for Aviation Safety (EPAS) 2020-2024 foresees the rulemaking task (RMT) RMT.0376 Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers, through which the European Union Aviation Safety Agency (EASA) intended to set-up a framework for reducing the risk of airborne collisions.
Before initiating RMT.0376, EASA undertook a detailed review and assessment of the airborne collision risk. The outcome of the assessment was summarised in a Best Intervention Strategy (BIS) that has been validated through a survey and a stakeholders' consultation.
The BIS concluded that a broader use of iConspicuity solutions and improvement of their interoperability together with a better airspace utilisation and design, while ensuring compatibility with U-space regulatory framework, should be at the heart of the future actions.
iConspicuity (or in-flight electronic conspicuity plus) means in-flight capability to transmit position of aircraft and/or to receive, process and display positions of other aircraft in a real time with the objective to enhance pilots' situational awareness about surrounding traffic. It is an umbrella term for a range of technologies and solutions, regardless whether airborne or on the ground, that can help airspace users and other affected stakeholders to be more aware of other aircraft in their vicinity or in a given airspace.
Therefore EASA decided that RMT.0376 will be removed from the EPAS and replaced by a strategy composed of a set of EPAS tasks compounded of existing rulemaking tasks which will be implemented through new safety promotion (SPT), research (RES) and member state tasks (MST). The best safety benefits are expected to be achieved through synergies of all proposed actions, while utilising the U-space regulatory framework as a catalyst for safety improvements.
The following bullet points summarize the collective actions which will be implemented for Anti-collision and traffic awareness systems for aircraft with maximum take-off mass less than 5700 kg or less than 19 passengers:
• EASA, with support of technical partners, will demonstrate and validate feasibility of achieving interoperability of different iConspicuity devices/systems through network of stations while respecting data privacy requirements.
• EASA will analyse 'Net Safety Benefit' and 'Operational Safety Assessment' concepts for the use of iConspicuity devices/systems in Flight Information Services.
• EASA will facilitate installation of iConspicuity devices in all EASA certified aircraft types and promote their use by airspace users at user affordable cost.

• EASA will actively support initiatives enhancing interoperability of iConspicuity devices/systems.
• EASA will promote good practices in airspace design that reduce 'airspace complexity' and 'traffic congestion' with the aim to reduce the risk of collisions involving uncontrolled traffic.
• Member States will consider 'airspace complexity' and 'traffic congestion' as safety relevant factors in airspace changes affecting uncontrolled traffic, including the changes along international borders.
• EASA will ensure technical and operational compatibility of U-space and iConspicuity solutions.
• EASA will conduct a Safety Issue Assessment (SIA) of airspace infringements.
• EASA will explore the use of iConspicuity data for enhanced safety monitoring of Airborne Collision Risk.

Collectively, the aforementioned EASA actions serve as a multi-pronged final response which address the safety concern for mitigating airborne collision risks.

Status: Closed

Sweden

Registration	Aircraft Type	Location	Date of event	Event Type
SE-DUX	BOMBARDIER CL600 2B19	Oajevágge, Norrbotten County, Sweden (position 6743N 01654E, 2 370 feet above mean sea level)	07/01/2016	Accident

Synopsis of the event:

The accident occurred on 8 January 2016 during a commercial cargo flight from Oslo/Gardermoen Airport (ENGM) to Tromsø/Langnes Airport (ENTC) and involved an aeroplane of the model CL-600-2B19, manufactured by Bombardier Inc. The aeroplane was operated by West Atlantic Sweden AB and had the registration SE-DUX.
The flight was uneventful until the start of the event, which occurred during the approach briefing in level flight at FL 330. The event started at 00:19:20 hrs during darkness without moonlight, clouds or turbulence. The lack of external visual references meant that the pilots were totally dependent on their instruments which, inter alia consisted of three independent attitude indicators.
According to recorded data and simulations a very fast increase in pitch was displayed on the left attitude indicator. The pilot in command, who was the pilot flying and seated in the left seat exclaimed a strong expression. The displayed pitch change meant that the pilot in command was subjected to a surprise effect and a degradation of spatial orientation The autopilot was, most probably, disconnected automatically, a "cavalry charge" aural warning and a single chime was heard, the latter most likely as a result of miscompare between the left and right pilots' flying displays (PFD).
Both elevators moved towards nose down and nose down stabilizer trim was gradually activated from the left control wheel trim switch. The aeroplane started to descend, the angle of attack and G-loads became negative. Both pilots exclaimed strong expressions and the co-pilot said "come up".
About 13 seconds after the start of the event the crew were presented with two contradictory attitude indicators with red chevrons pointing in opposite directions. At the same time none of the instruments displayed any comparator caution due to the PFDs declutter function in unusual attitude. Bank angle warnings were heard and the maximum operating speed and Mach number were exceeded 17 seconds after the start of the event, which activated the overspeed warning. The speed continued to increase, a distress call was transmitted and acknowledged by the air traffic control and the engine thrust was reduced to flight idle.

The crew was active during the entire event. The dialogue between the pilots consisted mainly of different perceptions regarding turn directions. They also expressed the need to climb. At this stage, the pilots were probably subjected to spatial disorientation. The aircraft collided with the ground one minute and twenty seconds after the initial height loss. The two pilots were fatally injured and the aeroplane was destroyed.

The accident was caused by insufficient operational prerequisites for the management of a failure in a redundant system.

Safety Recommendation SWED-2016-005:

Ensure that the design criteria of PFD units are improved in such a way that pertinent cautions are not removed during unusual attitude or declutter modes. [RL 2016:11 R3]

Reply No 1 sent on 03/03/2017: Pitch miscompare flags are implemented in Primary Flight Displays (PFD) to mitigate the effect of misleading attitude indication. The intent of the certification requirements for PFD is that miscompare flags are not removed in unusual attitudes or declutter modes.
EASA is in contact with TCCA, primary certification authority for the CL600-2B19, to analyse the reasons why the pitch miscompare flag is removed in this design in unusual attitudes. In parallel, EASA is investigating if any other EASA certified design has similar design features.

Reply No 2 sent on 20/12/2018: Pitch miscompare flags are implemented in Primary Flight Displays (PFD) to mitigate the effect of misleading attitude indication. The intent of the certification requirements for PFD is that miscompare flags are not removed in unusual attitudes or declutter modes.

EASA has carried out an analysis of the design criteria for PFD units in coordination with the primary certification authority for the subject aircraft (Transport Canada Civil Aviation) and the Federal Aviation Administration. The data indicates that there is no systemic issue caused by the current system safety guidance, and in particular, the guidance concerning the display of misleading attitude information and other such primary flight information.

Nevertheless, EASA intends to provide additional guidance to indicate that the failure message, flag, or comparative monitoring alert for any fault that can contribute to, or cause, misleading presentations of primary flight information, should remain on the PFD or in the primary field of view during modes of declutter, where they may be otherwise masked or removed.

The Agency has also reviewed the other EASA certified designs, and has found that, in a few models, the current design is such that certain miscompare flags are removed in

declutter modes. EASA intends to assess if, for those few models, any design or procedural improvement is feasible.

Reply No 3 sent on 30/04/2020: On 20 January 2020, the European Union Aviation Safety Agency (EASA) published the Notice of Proposed Amendment (NPA) 2020-01 from rulemaking task RMT.0673 'Regular update of CS-25' which includes proposed new provisions under Acceptable Means of Compliance (AMC) 25-11 to clarify that specified alerts should remain visible when primary flight displays declutter.

The NPA proposes a change to AMC 25-11 (Electronic Flight Deck Displays) under item 9: https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-01

The change clarifies that 'Failure messages, flags, or comparative monitoring alerts related to the information required by CS 25.1303 should not be removed by decluttering the display'.

The outcome of this NPA will be part of an amendment to CS-25 which is currently expected to be published in an Executive Director Decision in Q1 2021.

Reply No 4 sent on 03/03/2021: The European Union Aviation Safety Agency (EASA) has published the Certification Specifications (CS) and Acceptable Means of Compliance (AMC) for Large Aeroplanes CS-25 - Amendment 26, amending AMC 25-11. Chapter 5 - ELECTRONIC DISPLAY INFORMATION ELEMENTS AND FEATURES, par. 31.2.4.b - Clutter and deClutter, states as follows:

"Failure messages, flags, or comparative monitoring alerts related to the information required to be indicated by CS 25.1303 should not be removed from the main Primary Flight Display by decluttering the display, as long as the associated indication is maintained on the Primary Flight Display."

In parallel, EASA has reviewed all European large aeroplanes certified designs and have concluded that there are only a few cases with similar design to the CL-600: the Dassault Aviation Falcon 2000, 2000EX and 50EX equipped with Rockwell Collins Proline IV EFD 4077 displays.

For these cases, it has been concluded that it would be impractical to modify them considering the pending obsolescence of these displays and the associated costs related to the software change. Dassault Aviation will inform the operators affected by the issue as per the subject of this Safety Recommendation.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
I-MLVT	FOKKER F27	AD Paris Charles de Gaulle	25/10/2013	Accident

Synopsis of the event:

The crew took off at 1 h 22 from runway 09R at Paris-Charles de Gaulle Airport for a postal cargo flight to Dole Tavaux aerodrome. At a height of approximately 1,300 ft, they heard the noise of an explosion coming from the cargo area. At the same time, it was noticed the left engine fire indicator illuminating, along with the aural warning. They declared an emergency and carried out the engine fire procedure, but found that the feathering control was stuck. The captain looked out of the window and saw that the fire had gone out and that part of the left engine was missing.
The aircraft was still controllable, the crew returned and landed the aircraft without any other problem at Paris-Charles de Gaulle. The front part of the left engine and the propeller, in several fragments, were found in a field directly underneath the path of the initial climb from runway 09R.

Safety Recommendation FRAN-2018-001:

EASA modifies Part 145 (and Part M as necessary) to require the maintenance organisation or the operator to keep a copy of all the detailed maintenance records and all the associated maintenance data until this data is superseded by equivalent new data, or for a sufficiently long period to reduce the risk of useful data being lost.[Recommendation FRAN-2018-001]
[[%_A133%]] - L'EASA modifie la part 145 (et la part M comme nécessaire) pour imposer que l'organisme d'entretien, ou l'opérateur, conserve une copie de tous les enregistrements d'entretien détaillés et de toutes les données d'entretien associées jusqu'à ce que ces informations soient remplacées par de nouvelles informations équivalentes, ou sur une durée suffisamment longue pour réduire le risque de perte d'information utile. [Recommandation FRAN-2018-001]

Reply No 1 sent on 22/03/2018: According to M.A.305 of Commission Regulation (EU) No 1321/2014,the maintenance organisation (in this case a Part-145 approved organisation) is required to retain the records necessary to prove that all requirements have been met for the issue of the certificate of release to service. On the other hand, the owner or continuing airworthiness management organisation (CAMO) shall retain the records necessary to establish the airworthiness status of the aircraft.

The Part-145 approved organisation shall retain all detailed maintenance records and any associated maintenance data for 3 years from the date the aircraft or component to which the work relates was released from the organisation. For additional information, this period exceeds what is established in ICAO Annex 6, of 1 year after the signing of the maintenance release.

Regarding the continuing airworthiness records to be retained by the owner or CAMO, the current regulation already provides comprehensive details of the records to be maintained and for how long. In particular, all detailed maintenance records in respect of the aircraft and any service life-limited component fitted thereto, shall be retained until such time as the information contained therein is superseded by new information equivalent in scope and detail but not less than 36 months after the aircraft or component has been released to service.

These details have recently been reconsidered under rulemaking task RMT.0276 on technical records. As a result of this activity, the Agency issued Opinion 13/2016, which clarifies some aspects of the continuing airworthiness. The specific record-keeping periods relevant to this safety recommendation are considered to be adequate and are not proposed to be amended.

In addition, according to M.A.614 (c) (3) of Commission Regulation (EU) No 1321/2014, when a maintenance organisation or an owner or continuing airworthiness management organisation terminates its operation, all appropriate records shall be properly transferred to the next organisation or owner.

In conclusion, the regulation now provides comprehensive details covering the intention of the safety recommendation and no further action is deemed necessary.

Reply No 2 sent on 12/11/2020: According to Commission Regulation (EU) 1321/2014 (not yet in force when the propeller overhaul of the involved aircraft was performed in July 2012), the maintenance organisation, in this case an organisation approved in accordance with Annex II (Part-145) to the above mentioned regulation ('Part-145 approved organisation'), is required to retain the records necessary to prove that all requirements have been met for the issue of the certificate of release to service. Additionally, the owner or continuing airworthiness management organisation (CAMO) shall retain the records necessary to establish the airworthiness status of the aircraft.

The Part-145 approved organisation shall retain all detailed maintenance records and any associated maintenance data for 3 years from the date the aircraft or component to which the work relates was released from the organisation. This period exceeds the provision established in the ICAO Annex 6 of 1 year after the signing of the maintenance release. The European Union Aviation Safety Agency (EASA) considers that this timeframe is sufficient to mitigate the risk of losing useful information.

Regarding the continuing airworthiness records to be retained by the owner or CAMO, current M.A.305 of Annex I (Part-M) to Regulation (EU) 1321/2014 already gives comprehensive details of the records to be maintained and for how long. In particular, all

detailed maintenance records in respect of the aircraft and any service life-limited component fitted thereto, shall be retained until such time as the information contained therein is superseded by new information equivalent in scope and detail but not less than 36 months after the aircraft or component has been released to service.

These details have been recently reconsidered by EASA with the assistance of a working group under the rulemaking task RMT.0276 in Technical Records. As a result of this activity EASA issued the Opinion 13/2016 which clarifies some aspects of the continuing airworthiness. The specific record keeping periods relevant to this safety recommendation are considered adequate and are not proposed to be amended.

To further clarify the issue for the organisations and people involved, EASA has added FAQ 19042 to the Frequently Asked Questions - Regulations - Continuing Airworthiness page of the EASA website. This information has again been updated in 2018 to better consider the "detailed maintenance records" issue mentioned in this safety recommendation also considering comments received from the Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile (BEA), replacing the term "dirty fingerprints" (Used in Federal Aviation Administration (FAA) guidance material since 1991) with a clearer wording of "information relevant to aircraft configuration/status and future maintenance" and "dimensional information contained in the task card sign-offs or work packages".

The newly worded FAQ 19042, now also including an illustration of the process, should make much clearer, that the technical information records required by the maintenance instructions to be retained, must be transmitted by the Approved Maintenance Organisation (AMO) to the operator/CAMO so they are kept until the time when it will be "superseded by new information", e.g. until the next overhaul.

Based on the above, the EASA considers that the current regulation together with the published guidance material and updated FAQ fully covers the intent of the safety recommendation and no further amendment of the regulation is needed.

Status: Closed

Australia

Registration	Aircraft Type	Location	Date of event	Event Type
VH-FVR	ATR ATR72	47 km WSW of Sydney Airport	20/02/2014	Accident

Synopsis of the event:

On 20 February 2014, a Virgin Australia Regional Airlines (VARA) ATR 72 aircraft, registered VH-FVR, operating on a scheduled passenger flight from Canberra, Australian Capital Territory to Sydney, New South Wales sustained a pitch disconnect while on descent into Sydney. The pitch disconnect occurred while the crew were attempting to prevent the airspeed from exceeding the maximum permitted airspeed (VMO). The aircraft was significantly damaged during the occurrence.

On 15 June 2016 the ATSB released its first interim investigation report that contained the following safety issue:
Inadvertent application of opposing pitch control inputs by flight crew can activate the pitch uncoupling mechanism which, in certain high-energy situations, can result in catastrophic damage to the aircraft structure before crews are able to react.

During the continued investigation of the occurrence, the ATSB has obtained an increased understanding of the factors behind this previously identified safety issue. This increased understanding has identified that there are transient elevator deflections during a pitch disconnect event that could lead to aerodynamic loads that could exceed the strength of the aircraft structure.

The ATSB also found that these transient elevator deflections were not identified, and therefore not considered in the engineering justification documents completed during the aircraft type's original certification process. The ATSB considers that the potential consequences are sufficiently important to release a further interim report prior to completion of the final investigation report.

The second interim report expands on information already provided in the interim report released on 15 June 2016 report and an update on the ATSB website on 10 June 2014. It is released in accordance with section 25 of the Act and relates to the ongoing investigation of the occurrence.

Safety Recommendation ASTL-2017-015:

The ATSB recommends that EASA monitor and review ATR's engineering assessment of transient elevator deflections associated with a pitch disconnect to determine whether the aircraft can safely withstand the loads resulting from a pitch disconnect within the entire operational envelope. In the event that the analysis identifies that the aircraft does not have sufficient strength, it is further recommended that EASA take immediate action to ensure the ongoing safe operation of ATR42/72 aircraft [AO-2014-032-SR-015].

Reply No 1 sent on 07/07/2017: EASA is in regular contact with ATR regarding their engineering assessment of transient elevator deflections associated with a pitch disconnect.

As an initial step, ATR is examining scenarios that were considered at the time of the original certification by analysing the relevant and most critical failure cases with pilot input consistent with the flight test data available. ATR has already performed a parametric study for the case of elevator jamming which shows that whatever the pilot input is, the loads experienced during the transient elevator deflections are below the certified ultimate loads.

As a second step, EASA and ATR have already started discussions regarding analyses of scenarios that will be evaluated based on current certification practices with regards to CS 25.671.

Finally, EASA and ATR will explore the severity of the consequences of dual input, looking at reasonable scenarios based on in-service experience.

The above overall plan is expected to be completed in autumn 2017. Should an unsafe condition be identified then ATR and EASA will take action as per Annex I paragraph 21.A.3 of Commission Regulation (EU) No 748/2012 to ensure the ongoing safe operation of the ATR42/72 aircraft.

Reply No 2 sent on 30/04/2020: In the context of this safety recommendation, the European Union Aviation Safety Agency (EASA) continues to work with ATR regarding the engineering assessment of transient elevator deflections associated with a pitch disconnect. Up to November 2019, EASA has received and reviewed preliminary data that indicates the aircraft can safely withstand the loads resulting from a pitch disconnect within the entire operational envelope. On that basis, the focus was temporarily shifted to improve the intended function at high speeds through a revised pitch uncoupling procedure. This review is in the final phase, and is expected to result in a update to the associated procedures in the Aircraft Flight Manual.

EASA and ATR will hold dedicated meetings in Q2 2020 to progress on ATR's documentary formalization of the engineering assessment of transient elevator

deflections associated with a pitch disconnect.

Status: Open

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
STUDY				

Synopsis of the event:

Studie über die Organisation und die Wirksamkeit des Such- und Rettungsdienstes der zivilen Luftfahrt (search and rescue – SAR) in der Schweiz.

Safety Recommendation SWTZ-2017-515:

Das Bundesamt für Zivilluftfahrt (BAZL) sollte zusammen mit der Europäischen Agentur für Flugsicherheit (European Aviation Safety Agency – EASA) Anstrengungen unternehmen, ELT konstruktiv und einbautechnisch so zu verbessern, dass ihr korrektes Funktionieren möglichst in allen Fällen gewährleistet ist.

Reply No 1 sent on 22/08/2017: EASA has already taken some actions to improve the availability of the alerting signal transmitted by ELTs (Emergency Locator Transmitter):

- European Technical Standard Order - ETSO-C126b ('406 and 121.5 MHz Emergency Locator Transmitter') was issued by EASA in August 2016. In this ETSO, hook and loop fasteners are excluded from the acceptable means to attach the ELT in the aircraft, because it is a known weak point of the ELT installation. The ETSO can be found here: https://www.easa.europa.eu/easa-and-you/aircraft-products/etso-authorisations/list-of-current-etso

- EASA published Certification Memorandum (CM) on 'Installation of ELTs' (EASA CM–AS-008 Issue 01) in December 2016. This CM provides guidance for the installation of ELTs and recommendations for the maintenance procedures that might improve the reliability of ELTs:
https://www.easa.europa.eu/document-library/public-consultations/certification-memoranda

- EASA is participating in a joint RTCA Special Committee 229/EUROCAE Working Group 98 in charge of preparing an update of the ELT minimum operational performance specifications DO-204A/ED-62A whose Terms of Reference include the following items:
• Antenna and cabling specifications,
• Crash safety specifications,

• So called 'second generation ELT' which use the Medium Earth Orbit Search And Rescue constellation (MEOSAR) providing instantaneous detection and location of the beacon.
The group is also working in improving the installation section of the standard.
Once this standard is updated, ETSO-C126b will be revised to refer to the latest standard, and CM–AS-008 will be updated to reflect these changes.

Additionally, in order to promote the installation of ELT within the General Aviation community, EASA allows the installation of ELTs in aircraft through a simplified process by means of a dedicated Standard Change. Refer to CS-SC101b in CS-STAN Issue 2: https://www.easa.europa.eu/document-library/certification-specifications/cs-stan-issue-2

Reply No 2 sent on 19/08/2019: EASA has taken the following actions to improve the availability of the alerting signal transmitted by ELTs (Emergency Locator Transmitter):

- European Technical Standard Order - ETSO-C126b ('406 and 121.5 MHz Emergency Locator Transmitter') has been issued in August 2016. In this ETSO, hook and loop fasteners are excluded from the acceptable means to attach the ELT in the aircraft, because it is a known weak point of the ELT installation. The ETSO can be found here: https://www.easa.europa.eu/easa-and-you/aircraft-products/etso-authorisations/list-of-current-etso

- EASA published Certification Memorandum (CM) on 'Installation of ELTs' (EASA CM–AS-008 Issue 01) in December 2016. This CM provides guidance for the installation of ELTs and recommendations for the maintenance procedures that might improve the reliability of ELTs:
https://www.easa.europa.eu/document-library/public-consultations/certification-memoranda

- EASA participated in a joint Radio Technical Commission for Aeronautics (RTCA) Special Committee 229/EUROCAE Working Group 98 which prepared an update of the ELT minimum operational performance specifications DO-204A/ED-62A which included the following items:
• Improved antenna and cabling specifications,
• Crash safety specifications,
• So called 'second generation ELT' which use the Medium Earth Orbit Search And Rescue constellation (MEOSAR) providing instantaneous detection and location of the beacon.
ED-62B has been issued in December 2018.

- EASA then published NPA 2019-06 on 22.5.2019, which proposed an update of ETSO-C126b. The proposed ETSO-C126c refers to ED-62B as minimum performance standard. The associated Decision is planned to be adopted by Q3/2019.
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2019-06

EASA published on 17 June 2019 Safety Information Bulletin (SIB) 2019-09 entitled Emergency Locator Transmitters and Personal Locator Beacon - Annual Testing. This SIB provides recommendations to operators to perform ELT and PLB annual test and inspection.

CS-27 and CS-29 amendments 5, issued on 25 June 2018, introduced new CS 27/29.1470 specifications requiring ELTs to be installed so as to minimise damage that would prevent its functioning following an accident or incident. AMC 27/29.1470 provides acceptable means to show compliance with these requirements.
https://www.easa.europa.eu/document-library/certification-specifications/cs-27-amendment-5
https://www.easa.europa.eu/document-library/certification-specifications/cs-29-amendment-5

Additionally, in order to promote the installation of ELT within the General Aviation community, EASA allows to install ELT in aircraft with a simplified process through the use of a dedicated Standard Change. Refer to CS-SC101b in CS-STAN Issue 2:
https://www.easa.europa.eu/document-library/certification-specifications/cs-stan-issue-2

Reply No 3 sent on 22/09/2020: The European Union Aviation Safety Agency (EASA) has taken the following actions to improve the availability of the alerting signal transmitted by Emergency Locator Transmitters (ELTs):

- European Technical Standard Order - ETSO-C126b ('406 and 121.5 MHz Emergency Locator Transmitter') was issued in August 2016. In this ETSO, hook and loop fasteners are excluded from the acceptable means to attach the ELT in the aircraft, because it is a known weak point of the ELT installation. The ETSO can be found at https://www.easa.europa.eu/easa-and-you/aircraft-products/etso-authorisations/list-of-current-etso

- EASA published a Certification Memorandum (CM) on 'Installation of ELTs' (EASA CM–AS-008 Issue 01) in December 2016. This CM provides guidance for the installation of ELTs and recommendations for the maintenance procedures that might improve the reliability of ELTs: https://www.easa.europa.eu/document-library/public-consultations/certification-memoranda

- EASA participated in the joint RTCA Special Committee 229/EUROCAE Working Group 98 which prepared an update of the ELT minimum operational performance specifications (MOPS) DO-204A/ED-62A which included the following items:
• Improved antenna and cabling specifications,
• Crash safety specifications,
• So called 'second generation ELT' which use the Medium Earth Orbit Search And Rescue constellation (MEOSAR) providing instantaneous detection and location of the beacon.

ED-62B was issued in December 2018.

- EASA published Executive Director (ED) Decision 2020/011/R on 23 July 2020 amending CS-ETSO (Amendment 16). This amendment introduces a revision of ETSO-C126b, i.e. ETSO-C126c, which incorporates ED-62B 'MOPS for Aircraft Emergency Locator Transmitters 406 MHz' as a minimum performance standard (including Change 1 clarification dated 16 June 2020).

https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2020011r

- EASA published on 17 June 2019 Safety Information Bulletin (SIB) 2019-09 entitled Emergency Locator Transmitters and Personal Locator Beacons (PBL) - Annual Testing. This SIB provides recommendations to operators to perform ELT and PBL annual test and inspection.

- CS-27 and CS-29 amendments 5, issued on 25 June 2018, introduced new CS 27/29.1470 specifications requiring ELTs to be installed so as to minimise damage that would prevent its functioning following an accident or incident. AMC 27/29.1470 provides acceptable means to show compliance with these requirements.
https://www.easa.europa.eu/document-library/certification-specifications/cs-27-amendment-5
https://www.easa.europa.eu/document-library/certification-specifications/cs-29-amendment-5

- Additionally, in order to promote the installation of ELT within the General Aviation community, EASA allows the installation of ELTs in aircraft with a simplified process through the use of a dedicated Standard Change. Refer to CS-SC101b in CS-STAN Issue 2: https://www.easa.europa.eu/document-library/certification-specifications/cs-stan-issue-2

Lastly, as side information, EASA has also produced safety promotion material to promote the proper registration and testing of ELTs:
https://www.easa.europa.eu/newsroom-and-events/news/sunny-swift-emergency-locator-transmitters

Status: Closed

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
HB-ZRV	AGUSTA A109	Rega-Basis Erstfeld	26/02/2015	Accident

Synopsis of the event:

Um 14:15 Uhr startete der Rettungshelikopter AgustaWestland AW109SP, eingetragen als HB-ZRV, vom Dach des Kantonsspitals Altdorf zum Überflug zur Einsatzbasis der Schweizerischen Rettungsflugwacht (Rega) in Erstfeld. Während des Anfluges zur Basis reduzierte der Pilot die Vorwärtsgeschwindigkeit des Helikopters bei gleichbleibender Sinkgeschwindigkeit.
Der Pilot erhöhte den kollektiven Blattverstellhebel (collective) kontinuierlich, um die Sinkgeschwindigkeit zu reduzieren. Diese verminderte sich jedoch nicht. In der Phase des Übergangs vom Vorwärts- zum Schwebeflug (transition) erhöhte sich der Leistungsbedarf des Helikopters.
Bei einer Vorwärtsgeschwindigkeit von weniger als 20 kt vergrösserte sich die Sinkgeschwindigkeit in den letzten Sekunden vor dem Aufprall von 1100 ft/min auf über 1300 ft/min und liess sich nicht mehr kontrollieren. Um 14:18 Uhr schlug der Helikopter rund 30 m südlich des Landeplatzes der Einsatzbasis der Rega auf einer Wiese auf. Drei der vier Insassen wurden verletzt und mussten in Spitalpflege gebracht werden.

Safety Recommendation SWTZ-2017-530:

Das Bundesamt für Zivilluftfahrt (BAZL) und die Europäische Agentur für Flugsicherheit (European Aviation Safety Agency – EASA) sollten prüfen, ob die Testverfahren für aufschlaghemmende Sitze im Helikoptermuster AgustaWestland AW109SP den tatsächlich auftretenden Bedingungen bei einem grundsätzlich überlebbaren Aufprall entsprechen. Gegebenenfalls sollten die Prüf- und Zulassungsbedingungen so verbessert werden, dass die Sitze einen ausreichenden Schutz bei solchen Unfällen bieten.

Reply No 1 sent on 22/08/2017: EASA is the certifying authority for the AgustaWestland AW109SP type design. The AW109SP is compliant with the applicable crashworthiness requirements which are established to provide the occupants with the greatest possible chance to egress a rotorcraft without serious injury after a survivable emergency landing or accident.

In November 2015, the Federal Aviation Administration (FAA) tasked the Aviation Rulemaking Advisory Committee (ARAC) with providing recommendations regarding occupant protection regulations in normal and transport category rotorcraft. An ARAC

Working Group, Rotorcraft Occupant Protection Working Group (ROPWG) has been tasked to provide recommendations to the ARAC on occupant protection rulemaking for initial certification and continued airworthiness.

Crashworthiness requirements will be evaluated as part of this task with the objective to improve the survivability of rotorcraft occupants in the event of a crash. EASA participates in the Working Group and will consider the outcome of this activity for application to the existing European fleet in the frame of EASA rulemaking task RMT.0710 on "Improvement in the survivability of rotorcraft occupants in the event of a crash".

The next deliverable for RMT.710, the terms of references (ToR) is planned to be published in the first quarter of 2018.

Reply No 2 sent on 12/11/2020: The European Union Aviation Safety Agency (EASA) issued the Type Certificate (TC) ref. EASA.R.005 on 25th of May 2009 for the Leonardo S.p.A. (formerly known as AgustaWestland S.p.A.) AW109 SP helicopter.

During the type certification process, the AW109 SP seats design was found compliant with the applicable crashworthiness requirements established in the Type Certificate Data Sheet (TCDS) ref. EASA.R.005. These requirements are established to provide the occupants with the greatest possible chance to egress a rotorcraft without serious injury after a survivable emergency landing or accident.

In November 2015, the Federal Aviation Administration (FAA) tasked the Aviation Rulemaking Advisory Committee (ARAC) with the objective of providing recommendations regarding occupant protection regulations in normal and transport category rotorcraft. An ARAC Working Group, the Rotorcraft Occupant Protection Working Group (ROPWG), was then tasked with the objective of providing recommendations to the ARAC on occupant protection rulemaking for initial certification and continued airworthiness related to rotorcraft not yet having fully incorporated the latest occupant protection regulations into their design.

EASA participated in the ARAC Working Group with the aim of considering the outcomes of this activity for application to the existing EASA States fleet under the framework of the EASA rulemaking task RMT.0710 on "Improvement in the survivability of rotorcraft occupants in the event of a crash". Specifically, EASA's objective was to assess the latest crashworthiness requirements with a view to improving the survivability of rotorcraft occupants in the event of a survivable crash and providing recommendation for their full or partial incorporation into the existing or newly manufactured fleet not having incorporated them yet. Please note that, as indicated above, this is not the case of AW109 SP which is already fully compliant with the applicable crashworthiness requirements as established in the TCDS ref. EASA.R.005.

The detailed investigation performed by the ARAC Working Group has led to the conclusion that the existing crashworthiness requirements are satisfactory and therefore not in need of any update or improvement.
Consequently, EASA considers that seats testing and approval conditions, prescribed by the latest Certification Specification (CS) CS 27/29 requirements, do not need any update

or improvement.

Status: Closed

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
HB-ZRV	AGUSTA A109	Rega-Basis Erstfeld	26/02/2015	Accident

Synopsis of the event:

Um 14:15 Uhr startete der Rettungshelikopter AgustaWestland AW109SP, eingetragen als HB-ZRV, vom Dach des Kantonsspitals Altdorf zum Überflug zur Einsatzbasis der Schweizerischen Rettungsflugwacht (Rega) in Erstfeld. Während des Anfluges zur Basis reduzierte der Pilot die Vorwärtsgeschwindigkeit des Helikopters bei gleichbleibender Sinkgeschwindigkeit.
Der Pilot erhöhte den kollektiven Blattverstellhebel (collective) kontinuierlich, um die Sinkgeschwindigkeit zu reduzieren. Diese verminderte sich jedoch nicht. In der Phase des Übergangs vom Vorwärts- zum Schwebeflug (transition) erhöhte sich der Leistungsbedarf des Helikopters.
Bei einer Vorwärtsgeschwindigkeit von weniger als 20 kt vergrösserte sich die Sinkgeschwindigkeit in den letzten Sekunden vor dem Aufprall von 1100 ft/min auf über 1300 ft/min und liess sich nicht mehr kontrollieren. Um 14:18 Uhr schlug der Helikopter rund 30 m südlich des Landeplatzes der Einsatzbasis der Rega auf einer Wiese auf. Drei der vier Insassen wurden verletzt und mussten in Spitalpflege gebracht werden.

Safety Recommendation SWTZ-2017-531:

Das Bundesamt für Zivilluftfahrt (BAZL) und die Europäische Agentur für Flugsicherheit (European Aviation Safety Agency – EASA) sollten zusammen mit den Herstellern des Helikoptermusters AgustaWestland AW109SP und des Notsenders ARTEX C406-N HM geeignete Massnahmen ergreifen, um die Funktionsfähigkeit des genannten Notsenders nach einem Unfall sicherzustellen.

Reply No 1 sent on 22/08/2017: EASA is assessing the recommendation and what would be the implications and appropriate measures to ensure the operability of the emergency transmitter, ARTEX C406-N HM after an accident.

Reply No 2 sent on 24/08/2020: The European Union Aviation Safety Agency (EASA) contacted the emergency locator transmitter (ELT) manufacturer and the Federal Aviation Administration (FAA) as the state of design is the United States of America. As a result of the investigations, and thanks to the support of the Schweizerischen Sicherheitsuntersuchungsstelle (SUST), the FAA issued the Special Airworthiness

Information Bulletin CE-19-12 and EASA issued Airworthiness Directive (AD) No: 2019-0235 on 20 September 2019 (corrected on 24 September 2019).

This AD imposes the testing of units with a reduced interval based on time in service on helicopters and limits the total time in service, unless the ELT is modified with an improved g-switch. In addition, EASA also released Safety Information Bulletin 2019-09, now at revision 1), that applies to ELTs of any model and recommends an annual testing of the ELT, in particular of the g-switch operation.

Furthermore, by Amendment 5 of Certification Specification (CS) CS-27 and CS-29 (both dated 14 June 2018) EASA introduced paragraph CS 27.1470/29.1470 foreseeing that 'Each emergency locator transmitter, including sensors and antennae, required by the applicable operating rule, must be installed so as to minimise damage that would prevent its functioning following an accident or incident.' In addition, associated acceptable means of compliance (AMC) 27.1470/29.1470 was also adopted to provide further details on the installation of the ELT, the content of which is derived from EASA Certification Memorandum CM-AS-008 on Installation of ELTs and also addresses the regular testing of ELTs.

Status: Closed

Singapore

Registration	Aircraft Type	Location	Date of event	Event Type
9V-OJF	BOEING 787	descent to WSSS - Singapore / Changi	26/11/2016	Incident

Synopsis of the event:

During flight from Sydney to Singapore on 26 November 2016, it is confirmed that the #2 engine (Engine Serial Number 10256) had an un-commanded shutdown during descent at approximately 7000ft altitude.

This event bares similarities to a previous event on ESN 10237 which took place on 24 August 2016 (EASA-2016002199; RR# 048/1000)

Safety Recommendation SING-2017-026:

The European Aviation Safety Agency require the engine manufacturer to review the design of the IP compressor blade to prevent the development of cracks.

Reply No 1 sent on 16/01/2018: The Agency is in contact with the engine manufacturer to review the design of the intermediate pressure compressor (IPC) blade regarding the development of cracks in the reported occurrence.
In addition, the Agency has published on 13 December 2017 an airworthiness Directive (AD) No. 2017-0248, requiring repetitive inspections of the affected IPC Rotor blades and IPC shaft Stage 2 dovetail posts and, depending on findings, removal from service of the engine for corrective action.
EASA will provide an updated response of further actions.

Reply No 2 sent on 20/03/2019: Following a review of the design of the IP compressor blade, EASA ensures that the entire Trent 1000 fleet is protected against the consequences of the development of cracks in the IP compressor rotor 1 and rotor 2 blades, as follows:

Trent 1000-A, -AE, -C, -CE, -D, -E, -G, and –H ("package B" models): Mandatory inspection according to the European Union Aviation Safety Agency (EASA) Airworthiness Directive 2018-0167R2;

Trent 1000-A2, -AE2, -C2, -CE2, -D2, -E2, -G2, -H2, -J2, -K2 and -L2 ("package C" models): Mandatory inspection according to EASA Airworthiness Directive 2018-0084R2;

Trent 1000-AE3, -CE3, -D3, -G3, -H3, -J3, -K3, -L3, -M3, -N3, -P3, -Q3 and -R3 ("Ten" models): Mandatory inspection according to the engine Airworthiness Limitations Section of the Instructions for Continued Airworthiness ;

Trent7000-72 and -72C ("7000" models): Mandatory blade life limit at 300 cycles in the engine Airworthiness Limitations Section of the Instructions for Continued Airworthiness

New rotor 1 and rotor 2 blades for "Package C" models were certified by EASA in December 2018. Installation of these blades according to Service Bulletin TRENT 1000 72-J941 constitutes a terminating action to EASA AD 2018-0084R2.

Redesigned rotor 1 and rotor 2 blades are planned for "Package B", "TEN" and "7000" models in 2019 to remove the need for mandatory inspections or life limit.

Reply No 3 sent on 22/09/2020: As stated in previous interim answers, following a review of the design of the intermediate pressure compressor (IPC) blade, the European Union Aviation Safety Agency (EASA) has ensured that the entire Trent 1000/7000 fleet is protected against the consequences of the development of cracks in the rotor 1 and rotor 2 blades as follows:

Trent 1000-A, -AE, -C, -CE, -D, -E, -G, and –H ("package B" models): Mandatory inspection according to EASA Airworthiness Directive (AD) 2019-0249 which superseded previous ADs 2019-0075 and 2018-0167R2;

Trent 1000-A2, -AE2, -C2, -CE2, -D2, -E2, -G2, -H2, -J2, -K2 and -L2 ("package C" models): Mandatory inspection according to EASA AD 2019-0248 which superseded previous ADs 2018-0084R2 and 2018-0073;

Trent 1000-AE3, -CE3, -D3, -G3, -H3, -J3, -K3, -L3, -M3, -N3, -P3, -Q3 and -R3 ("Ten" models): Mandatory inspection according to the engine Airworthiness Limitations Section (ALS) of the Instructions for Continued Airworthiness (ICA);

Trent 7000-72 and -72C ("7000" models): Mandatory blade life limit at 300 cycles in the engine ALS of the ICA.

New rotor 1 and rotor 2 blades for "Package C" models were certified by EASA in December 2018. Installation of these blades according to Service Bulletin TRENT 1000 72-J941 constitutes a terminating action to EASA AD 2019-0248.

The redesign of rotor 1 and rotor 2 blades for the "TEN" and "7000" models was certified by EASA in September 2019. The mandatory inspection or life limit of the ALS is not applicable to these new blades introduced by Service Bulletin TRENT 1000 72-AK117 and 72-AK210.

Finally, the redesign of rotor 1 and rotor 2 blades is currently being processed by EASA for the "Package B" model and will be approved in the coming months. AD 2019-0249 is not applicable to these new rotor 1 and rotor 2 blades.

In summary, the review of the IPC blade design to prevent the development of cracks has resulted in mandatory containment actions, and in the design of new blades which are not affected by the same cracking problem for all Trent 1000/7000 engine models.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-WNSR	SIKORSKY S92	West Franklin Platform, North Sea	28/12/2016	Accident

Synopsis of the event:

The helicopter was being operated from Aberdeen on a contract on behalf of an offshore oil and gas company. On 27 December 2016, during a flight on the day prior to the accident, the Health and Usage Monitoring System (HUMS) recorded vibration data which contained a series of exceedences related to the tail rotor pitch change shaft (TRPCS) bearing.

On 28 December 2016, during the first sector of the day, the HUMS recorded further exceedences but these were not scheduled to be downloaded and reviewed until the helicopter returned to Aberdeen; there was no method in place for either the flight crew or maintenance personnel to be made aware of these further exceedences until then. During lift off on the second sector, the helicopter suffered an uncommanded right yaw through 45° and the flight crew re-landed. The helicopter was again lifted into the hover and responded normally to the controls, so the event was attributed to a wind effect and the helicopter departed en route.

The five-minute flight to the West Franklin wellhead platform was uneventful but, in the latter stages of landing, yaw control was lost completely and the helicopter yawed to the right. The crew landed the helicopter expeditiously, but heavily, on the helideck. The helicopter continued to rotate to the right and the crew closed the throttles before it came to rest near the edge of the helideck having turned through approximately 180°. There were no injuries.

The investigation determined that the TRPCS bearing had degraded and failed. As a consequence, the tail rotor pitch change servo was damaged resulting in uncommanded and uncontrolled inputs being made to the tail rotor (TR). The manner in which the servo was damaged had not been previously identified.
The investigation identified the following causal factors to the loss of yaw control:
- The TRPCS bearing failed for an undetermined reason.
- The TRPCS bearing failure precipitated damage to the tail rotor pitch control servo.

Safety Recommendation UNKG-2018-006:

It is recommended that the European Aviation Safety Agency commission research into the development of Vibration Health Monitoring data acquisition and processing, with the aim of reducing the data set capture interval prescribed in the Acceptable Means of Compliance to CS 29.1465 and thereby enhancing the usefulness of VHM data for the timely detection of an impending failure.

Reply No 1 sent on 27/04/2018: EASA agrees with the intent of the recommendation and the research project proposal RES.011 "Helicopter, tilt rotor and hybrid aircraft Gearbox health monitoring- In-situ failure detection" has been added in the European Plan for Aviation Safety EPAS 2018-2022. One of the objectives of the research will be to investigate the feasibility of maximising the number of vibration health monitoring data acquisitions per flight (whatever the flight profile).

Reply No 2 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has published the European Plan for Aviation Safety (EPAS) 2020-2024 which includes the research project RES.011 "Helicopter, tilt rotor and hybrid aircraft gearbox health monitoring — in-situ failure detection".

The main objective of the research is to evaluate new technologies for in-situ detection of tilt rotor, helicopter and hybrid aircraft gearbox failures.

As a first step the Agency is assessing the results obtained by other stakeholders in this field, such as the iGEAR project led by Cranfield University and funded through the EU Clean Sky programme (https://www.cranfield.ac.uk/research-projects/igear).

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-WNSR	SIKORSKY S92	West Franklin Platform, North Sea	28/12/2016	Accident

Synopsis of the event:

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The investigation determined that the TRPCS bearing had degraded and failed. As a consequence, the tail rotor pitch change servo was damaged resulting in uncommanded and uncontrolled inputs being made to the tail rotor (TR). The manner in which the servo was damaged had not been previously identified.
The investigation identified the following causal factors to the loss of yaw control:
- The TRPCS bearing failed for an undetermined reason.
- The TRPCS bearing failure precipitated damage to the tail rotor pitch control servo.

Safety Recommendation UNKG-2018-007:

It is recommended that the European Aviation Safety Agency amend the regulatory requirements to require that Vibration Health Monitoring data gathered on helicopters is analysed in near real-time, and that the presence of any exceedence detected is made available to the flight crew on the helicopter; as a minimum, this information should be available at least before takeoff and after landing.

Reply No 1 sent on 08/06/2018: The European Plan for Aviation Safety (EPAS) 2018-2022 includes rulemaking task RMT.0711 in order to achieve a "Reduction in accidents caused by failures of critical rotor and rotor drive components through improved vibration health monitoring systems".
The primary objective of this task is to update the existing acceptable means of compliance relating to vibration health monitoring (VHM) in order to take account of advances in technology and current operational best practices. The scope of RMT.0711 will consider the improvement of the frequency of data collection and analysis and will also consider the possibility for provision of a cockpit indication to inform flight crew in the event of a VHM threshold exceedance.

Reply No 2 sent on 22/06/2020: Rulemaking task RMT.0711, which takes into account this safety recommendation, has been initiated with the publication of its Terms of Reference (ToR) and its Group Composition for on 5 March 2020: https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0711

The specific objective of this RMT is to reduce the likelihood of hazardous and catastrophic failure modes by improving the incipient fault detection capabilities of current inspection procedures. This will be achieved by enabling vibration health monitoring (VHM) systems to be a more integral part of the continued airworthiness regime of rotorcraft and by ensuring that better and updated guidance is provided for the design and the routine and effective in-service use of these systems. It is considered that this will allow VHM systems to support the optimisation of maintenance of the rotor and rotor drive system and, thus, reduce the risk of maintenance errors.

Reply No 3 sent on 12/11/2020: The European Union Aviation Safety Agency (EASA) confirms that the intent of the Safety Recommendation will be taken into account in rulemaking task RMT.0711. The rulemaking group has planned to evaluate the need for additional guidance in the acceptable means of compliance (AMC) 29.1465 regarding near real time vibration health monitoring (VHM) processing linked to cockpit indications to be provided before takeoff, after landing and during flight. The group, considering the criticality of the monitored system and the time from detection to failure, will:
• Decide if and when real time analysis is required and to what extent it is practical,
• Summarise the potential benefits and difficulties of providing flight crew with "information" before take-off, after landing and during flight.

• Propose additional guidance with regards to the application of VHM systems when real time analysis is used and the flight crew needs to be informed/act.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-001:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) commission research into crack development in high-loaded case-hardened bearings in aircraft applications. An aim of the research should be the prediction of the reduction in service-life and fatigue strength as a consequence of small surface damage such as micro-pits, wear marks and roughness.

Reply No 1 sent on 28/09/2018: The Agency intends to commission a research project, the scope of which will include identification of rotor drive system critical parts and associated damage mechanisms, identification of significant design, operational and environmental parameters, identification and characterization of significant threats and recommendation of design standards to ensure flaw tolerant structural integrity. The research project is listed as RES.008 (Rotorcraft main gear box (MGB) design to guarantee integrity of critical parts and system architecture to prevent separation of the main rotor following any MGB failure.) in the draft European Plan for Aviation Safety 2019-2023, which is currently undergoing consultation with the Agency’s advisory bodies.

Reply No 2 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has published the European Plan for Aviation Safety (EPAS) 2020-2024 which includes the research project RES.008 "Integrity improvement of rotorcraft main gear boxes (MGB)".

The main objectives of the research are the following:

1. Enhancement of new design features for helicopter MGB and attachments, to prohibit separation of the mast and main rotor from the helicopter at any time, and allow the helicopter to autorotate in case of any major failure of main gear box components.
2. Understand threats to the integrity of critical components in the rotor drive system and assess methods to design and substantiate the design of flaw-tolerant critical components.

In the frame of this research, deeper investigation of the critical design parameters and characteristics of critical parts, the threats they face during their service life and the methods used to substantiate the integrity and flaw tolerance of these parts, is proposed in order to investigate opportunities to minimise the likelihood of failure. This will include prediction of the reduction in service-life and fatigue strength as a consequence of small surface damage such as micro-pits, wear marks and roughness. Additionally, architectural concepts for the rotor and rotor drive system will be reviewed to prevent or reduce exposure to catastrophic failure modes.

The final report is expected for Q1 2023.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-002:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) assess the need to amend the regulatory requirements with regard to procedures or Instructions for Continued Airworthiness (ICA) for critical parts on helicopters to maintain the design integrity after being subjected to any unusual event.

Reply No 1 sent on 28/09/2018: EASA will conduct a Preliminary Impact Assessment (PIA) in order to assess the need to amend the certification specifications for large rotorcraft (CS-29) with regard to procedures or instructions for continued airworthiness for critical parts on helicopters to maintain the design integrity after being subjected to any unusual event. Once the PIA is mature, stakeholders will be consulted. Consultation is expected to take place in 02Q2019.

Depending on the outcome of the PIA, EASA will include an appropriate task in the European Plan for Aviation Safety.

Reply No 2 sent on 14/12/2020: Subsequent to our first response, the European Union Aviation Safety Agency (EASA) has decided to address this safety recommendation

under rulemaking task RMT.0128 ‘Regular update of CS-27&29’. A Notice of Proposed Amendment (NPA) is being prepared and is planned to be published in Q2 2021.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-003:

The Accident Investigation Board Norway recommends that European Aviation Safety Agency (EASA) amend the Acceptable Means of Compliance (AMC) to the Certification Specifications for Large Rotorcraft (CS-29) in order to highlight the importance of different modes of component structural degradation and how these can affect crack initiation and propagation and hence fatigue life.

Reply No 1 sent on 28/09/2018: EASA will conduct a preliminary impact assessment (PIA) to assess the need to amend the Acceptable Means of Compliance (AMC) to the Certification Specifications for Large Rotorcraft (CS-29) in order to highlight the importance of different modes of component structural degradation and how these can affect crack initiation and propagation and hence fatigue life. The aim of such AMC could be to add specific reference to modes of component structural degradation related to rolling contact fatigue and how these can affect crack initiation and propagation and, hence, fatigue life. Once the PIA is mature, stakeholders will be consulted. Consultation is expected to take place in 02Q2019.

Depending on the outcome of the PIA, EASA will include an appropriate task in the European Plan for Aviation Safety.

In the meantime, EASA is already raising the issue during certification projects via a dedicated Certification Review Item (CRI) providing Interpretative Material to better assess the effect of rolling contact fatigue.

Reply No 2 sent on 14/12/2020: Subsequent to our first response, the European Union Aviation Safety Agency (EASA) has decided to address this safety recommendation under rulemaking task RMT.0128 'Regular update of CS-27&29'. A Notice of Proposed Amendment (NPA) is being prepared and is planned to be published in Q2 2021.

In the meantime, EASA continues to raise the issue during certification projects via a dedicated Certification Review Item (CRI), providing interpretative material to better assess the effect of rolling contact fatigue.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-005:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) develop MGB certification specifications for large rotorcraft to introduce a design requirement that no failure of internal MGB components should lead to a catastrophic failure.

Reply No 1 sent on 28/09/2018: The Agency understands that the objective of this Safety Recommendation is that future rotor drive system design requirements will ensure that "no failure of internal MGB components should lead to a catastrophic failure." However, such designs would be so radically different from existing transmission systems that their feasibility needs to be assessed.

EASA considers that the number of potentially catastrophic failure modes should be minimised. Accordingly,
any component, the failure of which has a potentially catastrophic failure effect, should not be acceptable if the failure hazard severity can be mitigated to a reduced level and where such measures are considered to be technically feasible and economically justifiable.

It is clear that design choices regarding rotor drive system architecture and individual gearbox design will influence the number of potentially critical parts.

In order to better understand the significance of these design choices, research is planned within the scope of project RES.008 (Rotorcraft main gear box (MGB) design to guarantee integrity of critical parts and system architecture to prevent separation of the main rotor following any MGB failure) in the draft European Plan for Aviation Safety (EPAS) 2019-2023, which is currently under consultation with stakeholders.

Reply No 2 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has published the European Plan for Aviation Safety (EPAS) 2020-2024 which includes the research project RES.008 "Integrity improvement of rotorcraft main gear boxes (MGB)".

The main objectives of the research are the following:

1. Enhancement of new design features for helicopter MGB and attachments, to prohibit separation of the mast and main rotor from the helicopter at any time, and allow the helicopter to autorotate in case of any major failure of main gear box components.
2. Understand threats to the integrity of critical components in the rotor drive system and assess methods to design and substantiate the design of flaw-tolerant critical components.

In the frame of this research, architectural concepts for the rotor and rotor drive system will be reviewed to prevent or reduce exposure to catastrophic failure modes.

The final report is expected for Q1 2023.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-004:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) revise the Certification Specifications for Large Rotorcraft (CS-29) to introduce requirements for MGB chip detection system performance.

Reply No 1 sent on 28/09/2018: EASA has recognised the need to improve certification specifications in CS-27 (small rotorcraft) and CS-29 (large rotorcraft) relating to Main Gear Box (MGB) chip detectors.

The current CS 27/29.1305(a)(23) and CS 27/29.1337(e) require chip detectors to provide a warning to the flight crew when particles of a sufficient size (or accumulation) are detected and are intended to allow the flight crew to check the correct operation of the relevant elements of the drive system.

EASA has conducted a Preliminary Impact Assessment (PIA) on the possible actions to improve the likelihood of detecting chips or particles in gearbox oil. The outcome of the PIA was the inclusion of a dedicated Rulemaking Task (RMT) 0725 in the draft European

Plan for Aviation Safety (EPAS) 2019-2023 which is currently undergoing consultation with the Agency's advisory bodies.

The planned RMT.0725 will consider an amendment of the current certification specifications and their associated acceptable means of compliance for demonstrating that the chip detectors perform their intended function.

Reply No 2 sent on 22/06/2020: The Terms of Reference (ToR) and the Group Composition (GC) for Rulemaking Task (RMT) 0725 'Rotorcraft chip detection system' were published on 7 April 2020 on the EASA Website: https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0725

The ToR includes a reference to this safety recommendation.

The specific objective of this RMT provided in the ToR is to ensure that an acceptable minimum level of effectiveness is achieved by the chip detection systems installed in rotorcraft drive systems (CS-27 and CS-29 types of rotorcraft will be addressed).

This objective is intended to be achieved by:
• introducing a new objective-based certification requirement for the demonstration of the performance of a chip detection system (Subtask 1); and,
• assessing whether it is necessary to implement a proportionate retroactive application of the certification requirements to the existing fleets and/or to the future production of type-certified rotorcraft (Subtask 2).

Subtask 1 should therefore address this safety recommendation.

The Notice of Proposed Amendment (NPA) for subtask 1 is currently planned to be published by Q1/2021.

Reply No 3 sent on : The Terms of Reference (ToR) and the Group Composition (GC) for Rulemaking Task (RMT) 0725 'Rotorcraft chip detection system' were published on 7 April 2020 on the EASA website: https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0725

The ToR include a reference to this safety recommendation.

The specific objective of the RMT is to ensure that an acceptable minimum level of effectiveness is achieved by the chip detection systems installed in rotorcraft drive systems (Certification Specification (CS)-27 and CS-29 types of rotorcraft will be addressed).

Ultimately, the aim is for rotorcraft rotor drive systems to feature systems that are capable of effectively detecting ferromagnetic particles indicating the incipient failure or degradation of internal gearbox components.

Two subtasks are defined in the ToR:

• Subtask 1: introducing a new objective-based certification requirement for the demonstration of the performance of a chip detection system; and
• Subtask 2: assessing whether it is necessary to implement a proportionate retroactive application of the certification requirements to the existing fleets and/or to the future production of type-certified rotorcraft.

Subtask 1 therefore addresses the intent of this safety recommendation.

On 29 January 2021, EASA published Notice of Proposed Amendment (NPA) 2021-01 dealing with subtask 1:
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2021-01

The NPA proposes to:
• Amend CS 27/29.1337 Powerplant instruments, to introduce the objective to demonstrate that the effectiveness of the chip detection is adequate.
• Amend Acceptable Means of Compliance (AMC) 29.917 Rotor drive system design, to introduce additional considerations for chip detection systems used as compensating provisions in the design assessments performed in accordance with point (b) of CS 29.917, to be taken into account in addition to those detailed in AMC 29.1337.
• Create a new AMC 27/29.1337 Powerplant instruments, to provide further acceptable means of compliance with the amended specification of CS 27/29.1337. This AMC will provide means to demonstrate the effective performance of a chip detection system, including objectives for an acceptable level of performance, as well as acceptable methodologies for using test and analysis means for compliance with the amended certification specifications of point (e) of CS 27/29.1337. In order to ensure a proportionate approach, the proposed AMC 27.1337 will allow a simplified demonstration of compliance for small rotorcraft that are not in CAT-A.
• Create a new Guidance Material (GM) 27/29.1337 Powerplant Instruments, describing design practices that may be considered when using AMC 27/29.1337 in order to demonstrate compliance with the amended certification specifications of point (e) of CS 27/29.1337.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-007:

The Accident Investigation Board Norway recommends that European Aviation Safety Agency (EASA) make sure that helicopter manufacturers review their Continuing Airworthiness Programme to ensure that critical components, which are found to be beyond serviceable limits, are examined so that the full nature of any damage and its effect on continued airworthiness is understood, either resulting in changes to the maintenance programme, or design as necessary, or driving a mitigation plan to prevent or minimise such damage in the future.

Reply No 1 sent on 28/09/2018: EASA will consider amending the Acceptable Means of Compliance (AMC) and Guidance Material (GM) to point 21.A.3A of Annex I (Part-21) to Commission Regulation (EU) No 748/2012, in order to clarify the obligations of Type Certificate Holders to ensure compliance with the requirement of "collecting, investigating and analysing reports of and information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the continuing airworthiness of the product(…)".

This will be performed within the frame of rulemaking task RMT.0031 dealing with the regular update of AMC/GM to Part-21. The next NPA is planned to be published 02Q2019.

Reply No 2 sent on 22/06/2020: In the frame of rulemaking task RMT.0031, dealing with the regular update of the Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex I (Part 21) to Regulation (EU) No 748/2012, Notice of Proposed Amendment (NPA) 2020-04 was published on 5.3.2020.
This NPA addresses this safety recommendation and proposes the following changes.
A new AMC3 21.A.3A(a) is proposed to provide a methodology for the Type Certificate (TC) holder to perform 'investigation' and 'analysis' of information related to failures, malfunctions, defects or other occurrences. When during the overall inspection of a part, especially of a part that is considered critical, its condition is found to be beyond the serviceable limit, a thorough investigation and analysis should be performed to understand the reason why the condition of the part is not consistent with the expected level of wear. In addition, the TC holder should assess whether a change to the design (e.g. to improve the durability of the part), to the instructions for continued airworthiness (e.g. to change the inspection or replacement frequency), and/or establishing a mitigation plan to prevent or minimise such occurrences in the future are necessary, in order to maintain an acceptable level of safety.
Moreover, it is proposed to also make applicable to point 21.A.3A(b)(1), the criteria for the determination of an 'unsafe condition' as defined in AMC 21.A.3B(b) and GM 21.A.3B(b), since the term 'unsafe condition' is also used in this point.
Finally, an amendment to point (10) of AMC1 21.A.243(a) is proposed to clarify that the Design Organisation handbook should include a description of the means to collect, monitor, analyse and respond to reports of problems which cause or might cause an adverse effect on the airworthiness or operational suitability of the product, part or appliance. A link with point 21.A.3A(a) is proposed, as well as a clarification of the types of reports which should be included regarding in-service issues.
The related EASA Decision is scheduled for Q3/2020.

Reply No 3 sent on : In the frame of rulemaking task RMT.0031, dealing with the regular update of the Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex I (Part 21) to Regulation (EU) No 748/2012, the European Union Aviation Safety Agency (EASA) published Notice of Proposed Amendment (NPA) 2020-04 on 5 March 2020, which took into account this safety recommendation and proposed to amend the AMC and GM to Part 21.

Following this public consultation, EASA published Executive Director (ED) Decision 2021/001/R of 1 March 2021:
https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2021001r

A new AMC3 21.A.3A(a) is introduced to provide a methodology for the design approval holder, so that the 'collection', 'investigation' and 'analysis' functions of its continued airworthiness system include specific means to analyse the collected failures, malfunctions, defects or other occurrences, and the related available information, to identify adverse trends, to investigate the associated root cause(s), and to establish any

necessary corrective action(s). It should also allow the determination of reportable occurrences as required under point 21.A.3A(b) - see GM 21.A.3A(b).

In addition, for parts whose failure could lead to an unsafe condition, the 'analysis' function of the system should ensure that reports and information sent, or available, to the design approval holder are fully investigated so that the full nature of any damage, malfunction, or defect and its effect on continuing airworthiness is understood. This may then result in changes to the design, to the instructions for continued airworthiness (ICAs), and/or in establishing a mitigation plan to prevent or minimise such occurrences in the future, as necessary, and is not limited to those requiring the involvement of EASA under point 21.A.3A(c).

Further guidance on this methodology is provided through:

•Updated GM 21.A.3A(a), including analysis of the early rejection of parts from service and related to the collection of information, and

•Updated GM1 21.A.3B(b), including the examination of worn parts, to support the determination of an unsafe condition.

Finally, an amendment to point 10 of AMC1 21.A.243(a) is introduced to clarify that the design organisation handbook should include a description of the means to collect, monitor, analyse and respond to reports of problems which cause or might cause an adverse effect on the airworthiness or operational suitability of the product, part or appliance. A link with point 21.A.3A(a) is introduced, as well as a clarification of the types of reports which should be included regarding in-service issues.

Status: Closed

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-008:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) review and improve the existing provisions and procedures applicable to critical parts on helicopters in order to ensure design assumptions are correct throughout its service life.

Reply No 1 sent on 29/09/2018: EASA issued Certification Memorandum (CM) CM-S-007 in 2015. The purpose of this CM was to supplement the existing guidance for compliance with CS 27/29.602 (Critical Parts), detailing the need for post certification actions to verify the continued integrity of Critical Parts. These actions should ensure that critical parts are controlled throughout their service life in order to maintain the critical characteristics on which certification is based. In addition, the effectiveness of any associated design, maintenance and monitoring provisions, which either help ensure the continued integrity or provide advance indication of impending failure of critical parts, should be assessed.

EASA will conduct a Preliminary Impact Assessment (PIA) in order to assess the potential safety benefit and economic impact of a number of changes to improve the Guidance

Material applicable to CS 29.602. Consideration will also be made to include the provisions of CM-S-007 within the Acceptable Means of Compliance of CS-29 'Book 2'. Consultation is expected to take place in 02Q2020.

Reply No 2 sent on 14/12/2020: The European Union Aviation Safety Agency (EASA) issued Certification Memorandum (CM) CM-S-007 in 2015. The purpose of this CM was to supplement the existing guidance for compliance with Certification Specification (CS) CS 27/29.602 (Critical Parts), detailing the need for post certification actions to verify the continued integrity of critical parts. These actions should ensure that critical parts are controlled throughout their service life in order to maintain the critical characteristics on which certification is based. In addition, the effectiveness of any associated design, maintenance and monitoring provisions, which either help ensure the continued integrity or provide advance indication of impending failure of critical parts, should be assessed.

Subsequent to our first response, EASA has decided to address this safety recommendation under rulemaking task RMT.0128 'Regular update of CS-27&29'. A Notice of Proposed Amendment (NPA) is being prepared and is planned to be published in Q2 2021. The NPA is intended to be based on the content of CM-S-007.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

On 29 April 2016 the main rotor suddenly detached from an Airbus Helicopters EC 225 LP Super Puma, operated by CHC Helikopter Service AS. The helicopter transported oil workers for Statoil ASA and was en route from the Gullfaks B platform in the North Sea to Bergen Airport Flesland.

The helicopter had just descended from 3,000 ft and had been established in cruise at 140 kt at 2,000 ft for about one minute. The flight was normal and the crew received no warnings before the main rotor separated from the helicopter. The helicopter impacted a small island near Turøy, northwest of Bergen. Wreckage parts were spread over a large area of about 180,000 m2 both at land and in the sea. The main rotor fell about 550 meters north of the crash site. The impact forces destroyed the helicopter, before most of the wreckage continued into the sea. Fuel from the helicopter ignited and caused a fire onshore. All 13 persons on board perished.

Safety Recommendation NORW-2018-009:

The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) research methods for improving the detection of component degradation in helicopter epicyclic planet gear bearings.

Reply No 1 sent on 28/09/2018: The Agency intends to commission a research project into rotorcraft gearbox health monitoring. The purpose of this research will be to investigate the use of new technologies, including both hardware and methods of analysis, to improve prognostic health monitoring capability for tilt rotor, helicopter and hybrid aircraft gearbox failures.

The scope of this research will include health monitoring of epicyclic gearbox components. This project is listed as RES.011 (Helicopter, tilt rotor and hybrid aircraft Gearbox health monitoring - In-situ failure detection) in the draft European Plan for Aviation Safety 2019-2023 which is currently undergoing consultation with the Agency's advisory bodies.

Reply No 2 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has published the European Plan for Aviation Safety (EPAS) 2020-2024 which includes the research project RES.011 "Helicopter, tilt rotor and hybrid aircraft gearbox health monitoring — in-situ failure detection".

The main objective of the research is to evaluate new technologies for in-situ detection of tilt rotor, helicopter and hybrid aircraft gearbox failures.

As a first step the Agency is assessing the results obtained by other stakeholders in this field, such as the iGEAR project led by Cranfield University and funded through the EU Clean Sky programme (https://www.cranfield.ac.uk/research-projects/igear).

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-ZBKF	BOEING 787	En route from London Heathrow to Delhi	29/04/2017	Serious incident

Synopsis of the event:

Departed with one pressurisation system U/S. Suffered gradual loss of pressure. Crew and pax went onto oxygen. Landed safely at LHR - no injuries.

Safety Recommendation UNKG-2018-009:

It is recommended that the European Aviation Safety Agency initiate a review to consider whether a repeatable and objective analysis technique can be applied to audio recordings to establish consistent installed performance of cockpit voice recorder systems.

Reply No 1 sent on 28/09/2018: Today various technologies exist to measure the quality of an audio system. Those technologies have different objectives like the most original repetition of a sound used e.g. for music recording or the intelligibility of voice messages e.g. in the context of hearing aids. As a first step EASA considers it important to agree on the objectives for a methodology which is bringing repeatable results in the assessment of Cockpit Voice Recorder (CVR) recordings during various aircraft operation conditions.
As part of the work the existing technical audio requirements for the elements of the CVR system will be considered to maintain consistency with those requirements. This may help defining overall recording quality indicators.
Once such objectives are formalised an assessment of various techniques is possible which may have the potential for repeatable results.

EASA plans to involve experts from other organisations to ensure that sufficient expertise is available.

Reply No 2 sent on 02/02/2020: The European Union Aviation Safety Agency has worked with the European Flight Recorder Partnership Group (EFRPG) on improving cockpit voice recorder (CVR) system specifications, including objective test measurement of the CVR audio quality. The current draft report proposes some methodology to achieve the recommended improvements. In order to have the improved specifications considered by the industry, EASA has asked EUROCAE to re-establish a working group updating 'ED-112A Minimum operational performance specification for crash protected airborne recorder systems'. ED-112A is the current industry standard for the installed

performance of CVR systems.

Status: Closed

Portugal

Registration	Aircraft Type	Location	Date of event	Event Type
CS-ALB	OTHER (PAULISTINHA 56(NEIVA)) OTHER (PAULISTINHA 56(NEIVA))	S. Pedro de Merelim (Braga)	18/08/2012	Accident

Synopsis of the event:

An aircraft with registration marks CS-ALB, model Paulistinha took off from Braga aerodrome (LPBR) on Aug 18, 2012 by 14:10 to perform a leisure flight, taking on board the pilot and a passenger. The flight to Ponte de Lima city and return to the departure aerodrome (Braga), about one hour later, went uneventfully.
The pilot, after approaching the aerodrome, decided to perform a "touch-and-go" manoeuvre on runway 25.
Still at low altitude (about 150 feet), at the end of the runway, the aircraft made a tight left turn (with 45° bank angle), lowered the nose, and crashed south of the airfield in a house backyard.
In the accident, the pilot, 75-year-old, Portuguese male, and the 80-year-old Portuguese male passenger perished.
Both Braga firefighter's organisations, the emergency medical service (INEM) and the national guard (GNR) shortly attended the occurrence site.

Probable causes:
Engine failure (IFSD) improperly managed by the pilot when trying to return to the airfield, resulting in aircraft loss of control.
It is likely that the engine power loss was due to improper fuel management and selection.

Contributing factors:
Pilot lack of preparation:
- to deal with the engine failure during take-off emergency,
- on fuel management and selection to/during the flight.

Safety Recommendation PORT-2018-016:

It is recommended that the European Aviation Safety Agency, EASA review and revise Regulation (EU) No 1178/2011 to include and specify the contents considered appropriate for the minimum one hour training flight with the flight instructor (FI), aiming the single-engine single-pilot class license revalidation. [Ref.FCL.740.A b) ii)]

Reply No 1 sent on 26/03/2019: The European Union Aviation Safety Agency (EASA) is considering this safety recommendation within the framework of Rulemaking Task RMT.0188 'Update of EASA FCL implementing rules' (see the European Plan for Aviation Safety 2019-2023 which is published on the EASA web site).

Opinion No 05/2017 (stemming from RMT.0188) containing proposed amendments to Commission Regulation (EU) No 1178/2011, was published by EASA on 29 June 2017. The associated amending regulation is planned to be published by the European Commission by Q3/2019. An associated Executive Director (ED) Decision will be published simultaneously by EASA, with related amendments to Acceptable Means of Compliance (AMC) and Guidance Material (GM).

In particular, it is anticipated that the ED Decision will include AMC and/or GM which specifies the contents for the practical training with a flight instructor for the single-pilot single-engine class rating revalidation [see FCL.740.A (b)(ii)].

Reply No 2 sent on 24/08/2020: Commission Regulation (EU) No 1178/2011 of 3 November 2011 as amended by Commission Implementing Regulation (EU) 2020/359 of 4 March 2020, states:

FCL.740.A Revalidation of class and type ratings — aeroplanes
(b) Revalidation of single-pilot single-engine class ratings.
(1) Single-engine piston aeroplane class ratings and [Touring Motor Glider] TMG class ratings. For the revalidation of single-pilot single-engine piston aeroplane class ratings or TMG class ratings, the applicants shall:
(i) within the 3 months preceding the expiry date of the rating, pass a proficiency check in the relevant class in accordance with Appendix 9 to this Part with an examiner; or
(ii) within the 12 months preceding the expiry date of the rating, complete 12 hours of flight time in the relevant class, including:
— 6 hours as [Pilot In Command] PIC,
— 12 take-offs and 12 landings, and
— refresher training of at least 1 hour of total flight time with a flight instructor (FI) or a class rating instructor (CRI). Applicants shall be exempted from this refresher training if they have passed a class or type rating proficiency check, skill test or assessment of competence in any other class or type of aeroplane.

As a result of the rulemaking activities as described in Reply No.1 sent on 26/03/2019 related to Safety Recommendation PORT-2018-016 (GPIAA), Annex I to ED Decision 2020/005/R Acceptable Means of Compliance (AMC) and Guidance (GM) to Part-FCL — Issue 1, Amendment 9, has introduced the following provisions:

AMC1 FCL.740.A(b)(1)(ii) Revalidation of class and type ratings
Content of the Refresher Training
Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. The briefing should include a discussion on [Threat and Error Management] TEM with

special emphasis on decision-making when encountering adverse meteorological conditions or unintentional [instrument meteorological conditions] IMC, as well as on navigation flight capabilities.

The European Union Aviation Safety Agency (EASA) therefore believes that the current regulatory framework appropriately addresses this topic.

Status: Closed

Portugal

Registration	Aircraft Type	Location	Date of event	Event Type
CS-DGU	CESSNA 152	Farm field to 1.2NM West of runway 03 threshold	10/07/2018	Accident

Synopsis of the event:

During the last phase of a VFR night training, on the 4th touch and go circuit at LPSO, the solo student pilot reported the RH downwind leg to runway 21.

According his instructor that was in the ATC room, watching the manoeuvres, suddenly the aircraft started a steep descent with possible drift to the left side of the pattern runway circuit. This descent path was maintained until the ground impact.

The pilot was found dead and the aircraft destroyed 1.2 NM West of runway 03 threshold.

Safety Recommendation PORT-2019-001:

It is recommended that the European Aviation Safety Agency, EASA, evaluate and change the ATP integrated training schedule, where the nightly solo training flight, currently in phase 3, will be completed only in phase 4 after the basic instrument flight lessons.

Reply No 1 sent on 29/05/2019: The European Union Aviation Safety Agency (EASA) is taking this safety recommendation into account within the framework of ongoing rulemaking task RMT.O188 'Update of EASA FCL implementing rules', through changes to the Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex I (Part-FCL) to Commission Regulation (EU) No 1178/2011.

The current proposal already contains a syllabus for night rating training including solo training for fixed-wing aircraft, also considering the Instrument Meteorological Conditions (IMC) training element at night.

In addition, the intention is to amend AMC1 to Appendix 3 to Part-FCL 'Training courses for the issue of a CPL (Commercial Pilot Licence) and an ATPL (Airline Transport Pilot Licence)' with regard to the sequence of basic instrument/night training during the integrated ATPL course.

The resultant Executive Director Decision is planned to be published in quarter 3 of 2019 (See the European Plan for Aviation Safety ((EPAS) 2019-2023).

Reply No 2 sent on 24/08/2020: As a result of the rulemaking activities as described in Reply No. 1, sent on 29/05/2019, related to Safety Recommendation PORT-2019-001 (Gabinete de Prevenção e Investigação de Acidentes com Aeronaves -GPIAA), Annex I to ED Decision 2020/005/R on Acceptable Means of Compliance (AMC) and Guidance (GM) to Part-FCL — Issue 1, Amendment 9, has introduced the following provisions:

AMC1 to Appendix 3 Training courses for the issue of a [Commercial Pilot License] CPL and an [Airline Transport Pilot License] ATPL
GENERAL
(d) The flight instruction syllabus should take into account the principles of [Threat and Error Management] TEM.

A. [Airline Transport Pilot] ATP integrated course: aeroplanes
FLYING TRAINING
(3) Phase 3:
(iii) dual night flight instruction time.
(4) Phase 4:
(vii) after completion of instrument training that is equivalent to the basic instrument flight module set out in AMC2 to Appendix 6, take-offs and landings as [Pilot In Command] PIC at night.

C. CPL/ [instrument rated] IR integrated course: aeroplanes
FLYING TRAINING
(d) […]
(3) Phase 3:
(iii) dual night flight instruction
(4) Phase 4:
(vii) after completion of instrument training that is equivalent to the basic instrument flight module set out in AMC2 to Appendix 6, take-offs and landings as PIC at night.

D. CPL integrated course: aeroplanes
FLYING TRAINING
(d) […]
(3) Phase 3:
(iii) night flight time including, after completion of instrument training that is equivalent to the basic instrument flight module set out in AMC2 to Appendix 6, take-offs and landings as PIC.

The European Union Aviation Safety Agency (EASA) therefore believes that the current regulatory framework appropriately addresses this topic.

Status: Closed

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
HB-2384	SCHEMPP HIRTH NIMBUS4DM	Segelflugfeld Amlikon (LSPA)	18/07/2018	Accident

Synopsis of the event:

Pilot und Fluglehrer planten einige Tage vor dem 18. Juli 2018 einen gemeinsamen Streckenflug mit dem eigenstartfähigen Segelflugzeug Nimbus-4DM, eingetragen als HB-2384, ab dem Flugfeld Amlikon (LSPA) zu unternehmen. Da sie nicht mit der Möglichkeit eines Starts im Flugzeugschlepp oder an der Startwinde rechneten, bereiteten sie sich für einen Eigenstart vor.
Der Pilot hatte vor dem 18. Juli 2018 noch nie selbst einen Eigenstart mit einem eigenstartfähigen Segelflugzeug ausgeführt.

Das Ausfahren des Propellers und das Anlassen des Motors führte der Pilot gemäss Checkliste aus. Er erwähnte anschliessend gegenüber dem Fluglehrer, dass es wichtig sei, beim Start nicht zu stark zu ziehen. Um 11:13:07 Uhr setzte sich die HB-2384 auf der Piste 27 in Amlikon in Bewegung (vgl. Abbildung 1). Die linke Flügelspitze war beim Anrollen am Boden, da keine Hilfspersonen verfügbar waren, um den Flügel waagrecht zu halten. Während der Anrollphase half der Fluglehrer mittels Steuereingaben beim Anheben des linken Flügels und achtete darauf, dass das Segelflugzeug nicht aus der Pistenachse rollte. Die Wölbklappen waren in der Anfangsphase des Startvorganges in der Stellung - 1 gerastet. Nach ungefähr 50 m Rollstrecke positionierte der Fluglehrer die Wölbklappen in die Stellung + 2 und überprüfte die Motordrehzahl, die zu diesem Zeitpunkt bei 6500 U/min lag.
Nach weniger als 400 m Rollstrecke hob die HB-2384 an der vom Piloten erwarteten Stelle von der Piste ab. Bei der Überprüfung der Fluggeschwindigkeit las er einen Wert von rund 85 km/h ab. Die Geschwindigkeit gegenüber dem Boden (Ground Speed – GS) betrug um 11:13:39 Uhr 82 km/h (vgl. Abbildung 2). Wenig später stellte der Pilot fest, dass das Segelflugzeug in einen Sackflug2 überging und dabei leicht nach links abkippte. Danach schlug das Segelflugzeug mit dem Hauptrad hart auf dem Boden auf, überrollte einen Weg und kam südlich der Piste zum Stehen. Der Fluglehrer gab an, dass er, nachdem er die Drehzahl des Motors überprüfte hatte, vom Piloten einen Ausruf hörte und unmittelbar danach den Aufprall wahrnahm.

Safety Recommendation SWTZ-2019-001:

Die Europäische Agentur für Flugsicherheit (European Aviation Safety Agency – EASA) sollte durch geeignete Massnahmen sicherstellen, dass die Ausbildung für Eigenstart mit Segelflugzeugen mit Klapptriebwerk bezüglich der typenspezifischen Risiken angepasst wird.

Reply No 1 sent on 13/03/2020: Commission Implementing Regulation (EU) 2020/358 of 4 March 2020 amending Implementing Regulation (EU) 2018/1976 as regards sailplane pilot licences was published in the Official Journal of the European Union on 05 March 2020. This is a dedicated regulation (Part-SFCL) for sailplane pilot licences and will apply from 08 April 2020.

At the same time, Commission Implementing Regulation (EU) 2020/359 of 4 March 2020 amending Regulation (EU) No 1178/2011 was published. This amendment (R2020/359) extracts the rules on sailplane pilot licences (now in R2020/358) from the air crew regulation (R1178). It will also apply from 08 April 2020.

When developing the new acceptable means of compliance (AMC) to Part-SFCL, EASA has revised the AMC related to training for the self-launch method in such a way that all of the following will be addressed:

•in-flight retraction of engine and engine cooling;
•propeller drag;
•effects of reduction and increase of power;
•pitch nose-up tendency in case of engine shutdown (in case of over-wing propeller installation);
•approach with extended retractable engine inoperative (may be simulated by extended airbrakes).
•decision process and reasons to terminate the soaring flight and to switch to powered flight;
•decision process and reasons for not starting the engine and to end the flight as a non-powered sailplane.

These new AMC will be published on the EASA within the next week and apply from 08 April 2020 together with Part-SFCL.

Status: Closed

Latvia

Registration	Aircraft Type	Location	Date of event	Event Type
YL-JKV	PIPER PA28	RIGA FIR	05/07/2018	Serious incident

Synopsis of the event:

Right side MLG wheel separation during flight due to landing gear strut breaking, probably during takeoff.

Safety Recommendation LATV-2019-002:

To make changes in the Airworthiness Directive 2005-0035 according to the recommendations of the aircraft manufacturer due to the main cause of the aviation serious incident of the aircraft PA-28-140 which is related to deficiencies in the regulatory documents of the aircraft maintenance.

Reply No 1 sent on 27/09/2019: Regarding the proposed revision of the Airworthiness Directive 2005-0035, the European Union Aviation Safety Agency is assessing, with the support of Piper (aircraft manufacturer) and the Federal Aviation Administration (primary certifying authority), the actions to take considering not only the availability of revised material (ie the aircraft manufacturer's Safety Bulletin 1311 A), but also the risk related to this occurrence and the service history of the Piper fleet with regard to this type of failure.

Reply No 2 sent on 30/04/2020: After the European Union Aviation Safety Agency (EASA) issued Airworthiness Directive (AD) 2005-0035, the type certificate holder (TCH) of the aircraft, PIPER AIRCRAFT Inc., issued revision A of Service Bulletin (SB) 1311 in 2016, adding instructions and illustrations to clarify the inspection procedure and providing instructions to remove the torque link to facilitate inspection.

EASA has reviewed this case together with the TCH and the Federal Aviation Administration (FAA), which represents the State of Design for the affected aeroplanes. EASA supports the application of Piper SB 1131A (and later revisions, if any) as part of the approved maintenance programmes of the affected aeroplanes. This is based on the following considerations:

- The service history of the affected aeroplanes with respect to this failure mode (in particular the consequence of the failure in the occurrences reported) and the criticality of a Main Landing Gear (MLG) failure;

- The reduced probability of such failure occurring in the remaining fleet, due to the improved inspection instructions available in Piper SB 1311A; and

- The gradual replacement in the fleet of cast MLG with forged MLG, having P/N 65490.

EASA has, therefore, determined that an acceptable level of safety exists and an AD is no longer necessary. Thus, EASA has issued cancellation notice AD No. 2005-0035-CN for the subject AD, effective from 20 February 2020.

Status: Closed

Iceland

Registration	Aircraft Type	Location	Date of event	Event Type
TF-IFC	TECNAM P2002	Kapelluhraun	12/11/2015	Accident

Synopsis of the event:

The aircraft impacted rugged lava terrain in Kapelluhraun near Hafnarfjörður, Greater Reykjavik. The airplane was destroyed and the two pilots onboard received fatal injuries.

Safety Recommendation ICLD-2019-001:

Require a spin test for VLA aircraft that goes through a major change, such as for MTOW, even though the C.G. excursion is the same.

Reply No 1 sent on 02/03/2020: The Agency has carefully assessed the proposed recommendation, taking into account the justifications provided. However, in line with paragraph 21.A.91 of Commission Regulation (EU) No 748/2012 (as amended) and the applicable Certification Specifications, a spin test is only required for major changes which are assessed by the applicant and accepted by EASA as having an impact on the spin characteristics as established under the original type certification basis. This applies regardless of the aircraft type-certification basis (e.g. CS-LSA, CS-VLA and CS-23).
For this reason, the mandatory requirement of a spin test for a major change is not found feasible.

Status: Closed

Finland

Registration	Aircraft Type	Location	Date of event	Event Type
YL-RAF	SAAB 340	EFSA (SVL) : Savonlinna	07/01/2019	Serious incident

Synopsis of the event:

The SAAB-340 veered outside from the LH side of runway during landing.
The aircraft become rest about 25 m outside of runway in a 90 degrees angle related to the RWY.

Safety Recommendation FINL-2019-003:

Despite the authorities' audits on safety management systems and the operators' self-monitoring, some operators have significant shortcomings in flight safety. The oversight authorities should have the capacity, methods and competency to extend the audits to the
implementation of safety management systems and to the assessment of flight safety.

The Safety Investigation Authority recommends that:
The European Union Aviation Safety Agency (EASA) ensure that the audits conducted by the EU Member States on operators also cover the practical functioning and performance of safety management systems. [2019-S59]

Reply No 1 sent on 02/03/2020: Existing requirements, measures and action plans (summarised below) are already in place to address the need for audits conducted by EU MSs on operators to cover the practical functioning and performance of safety management systems.

Air Operations Regulatory Framework

The existing air operations regulatory framework includes operator and authority implementing rules, Acceptable Means of Compliance (AMC) and Guidance Material (GM), on Safety Management Systems (SMS) (see Commission Regulation (EU) No 965/2012 and associated Executive Director (ED) Decisions), in particular:

•The operator is required to establish, implement and maintain a management system that includes the identification of aviation safety hazards entailed by the activities of the operator, their evaluation and the management of associated risks, including taking actions to mitigate the risk and verify their effectiveness [ORO.GEN.200 (a)(3)]. It shall

include a function to monitor compliance with the applicable requirements. Compliance monitoring shall include a feedback system of findings to the accountable manager to ensure effective implementation of corrective actions as necessary [ORO.GEN.200 (a)(6)].

•The Competent Authority (CA) is required to verify continued regulatory compliance by organisations it has certified [ARO.GEN.300 (a)(2)]. This oversight function, as described under Section III 'Oversight, Certification and enforcement' of Annex II of Commission Regulation (EU) No 965/2012, requires the competent authority to conduct audits and inspections, including ramp and unannounced inspections [ARO.GEN.300 (b)(3)]. The operator is required to demonstrate its competence and capability to develop and execute effectively robust procedures for the preparation and safe operation of flights [(a)(4) of AMC2 ARO.GEN.300(a);(b);(c)]. The CA should continue to assess the organisation's compliance with the applicable requirements, including the effectiveness of the management system [(b) of GM1 ARO.GEN.300(a);(b);(c)]. This should ensure that the Member States (MS) assess the practical functioning and performance of the operators' management systems.

Implementation Support by EASA

To support the understanding of the importance of effective CA oversight of SMS implementation, the European Union Aviation Safety Agency (EASA) organised a dedicated SMS air operations workshop for industry and CAs on 12 and 13 February 2019. The associated presentations are published at: https://www.easa.europa.eu/newsroom-and-events/events/air-ops-sms-workshop.

In addition, EASA issued a continuous monitoring bulletin based on the results of standardisation inspections of operators' SMS oversight, which was presented and discussed during the May 2019 meeting of the Air Operations TeB (an EASA technical advisory body).

EASA has also published a management system assessment tool to support the assessment of management systems during initial certification and continuing oversight by the CA, and to promote a common approach to management system assessment and continuous improvement of SMS. It is available on the EASA web site at:- https://www.easa.europa.eu/document-library/general-publications/management-system-assessment-tool.

Member State Task MST.026 'SMS Assessment' in the European Plan for Aviation Safety (EPAS) 2020-2024 states that MSs should make use of the EASA management system assessment tool to support risk- and performance-based oversight, and that MSs should regularly inform EASA about the status of compliance with SMS requirements and SMS performance of their industry.

The European Plan for Aviation Safety

Focussed Attention Topic FOT.008 'Operator's management systems' has been included in the EPAS since the 2016-2020 edition. The objective being to ensure that EASA's

standardisation inspections have due regard for the ability of CAs to evaluate and oversee the operator's management systems, in particular the consideration paid to specific safety risks, such as safety culture, the governance structure of the operator, and any other feature that may introduce new risks.

FOT.003 on 'Unavailability of adequate personnel in competent authorities' has been included in the EPAS since the EPAS 2016-2020 edition, requiring MSs to ensure that adequate personnel are available to discharge their safety oversight responsibilities. In addition, the CA should have the full capability to adequately assess the continued competence of an organisation by ensuring that the whole range of activities is assessed by appropriately qualified personnel (see ED Decision 2017/006/R).

In the EPAS 2020-2024, FOT.003 and FOT.008 have been replaced by MST.032 'Oversight capabilities/focus area'. The focus is on safety culture, the governance structure of the organisation, the interaction between the risk identification/assessment process and the organisation's monitoring process, the use of inspection findings and safety information such as occurrences, incidents, and accidents.

MST.002 'Promotion of SMS' has been included in the EPAS since EPAS 2016-2020. MSs should encourage implementation of safety promotion material developed by the European Safety Promotion Network, the Safety Management International Collaboration Group (SMICG) and other relevant sources of information on the subject of safety management.

EASA Standardisation Activities

The objective of EASA's standardisation activities is to monitor the application of Regulation (EU) 2018/1139 and its implementing rules by CAs. The working methods for carrying out standardisation activities are described in Commission Implementing Regulation (EU) No 628/2013, which relies on a system-oriented Continuous Monitoring Approach (CMA). These activities consist of a monitoring part, where data from CAs, ICAO, the European Commission, and other sources is gathered and analysed (inter alia to prioritise inspections), and of an inspection part where inspections are carried out to directly verify the application of the rules on-site. Reports on standardisation activities are then provided to the European Commission and to the Member States concerned.

'SYS' is an EASA abbreviation for standardisation inspections that focus on the implementation of Regulation (EU) No 376/2014 on occurrence reporting and on the verification of the CA management system. SYS phase I, which is ongoing, provides a means for EASA to oversee the capabilities and effectiveness of the Member States' oversight activities. SYS phase II, which will focus on the State Safety Programme (SSP) and the State Plans for Aviation Safety (SPAS), will start in 2021, and should serve to re-enforce the oversight capabilities of the MS through the EASA standardisation inspections; notably the MS will have to inform EASA how the EPAS actions have been considered and transposed in their SSP and SPAS.

Summary

All of the above-mentioned requirements, measures and action plans are already established to address the need for audits conducted by EU MSs on operators to cover the practical functioning and performance of safety management systems.

Status: Closed

Finland

Registration	Aircraft Type	Location	Date of event	Event Type
YL-RAF	SAAB 340	EFSA (SVL) : Savonlinna	07/01/2019	Serious incident

Synopsis of the event:

The SAAB-340 veered outside from the LH side of runway during landing.
The aircraft become rest about 25 m outside of runway in a 90 degrees angle related to the RWY.

Safety Recommendation FINL-2019-004:

Flight data recorders (FDR) recording on magnetic tape are clearly less reliable than modern devices. Recordings that are of poor quality, or altogether missing, make it significantly harder for the safety investigation to establish the sequence of events.

The Safety Investigation Authority recommends that:
The European Union Aviation Safety Agency (EASA) set a deadline for the use of flight data recorders recording on magnetic tape. [2019-S60]

On 26 April 219 the UK Air Accidents Investigation Branch (AAIB) also issued a safety recommendation (UNKG-2091-002) to the EASA on ending the use of flight data recorders recording on magnetic tape. In its reply on 26 June 2019 the EASA reported that replacing the
FDRs that use magnetic tape would most probably be allocated a low priority.

The process of replacing cockpit voice recorders (CVR) recording on magnetic tape with modern ones is farther ahead. Annex 6 to the Convention on International Civil Aviation has recommended that the use of magnetic tape FDRs and CVRs be discontinued by 1 January 2016.
The EASA is the only body which can implement the ICAO's recommendation. The EASA banned the use of cockpit voice recorders recording on magnetic tape effective 1 January 2019, but has not done the same for flight data recorders.

To improve the reliability and quality of data recorded by FDRs and CVRs, EASA initiated a rule making task (RMT. 0249) in 2016. The corresponding amendment proposal (NPA 2019-12) has been sent for comments on 13 November, 2019.

Reply No 1 sent on 02/03/2020: Prohibiting the use of flight data recorders (FDRs) that use magnetic tape as a recording medium was considered under European Union Aviation Safety Agency (EASA) rulemaking tasks RMT.0400 & RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'.

The results of the related Regulatory Impact Assessment (RIA) are contained in the associated Notice of Proposed Amendment NPA 2013-26, which was published on 20 December 2013. As described in the RIA, a conservative assumption was that, on 1 January 2013, 20% of FDRs installed on aeroplanes operated for commercial air transport by EASA Member State operators were using magnetic tape technology. The proportion of magnetic tape FDRs was assumed to decrease at a rate corresponding to the renewal rate of the fleets of aeroplanes of EASA Member State operators. Assuming an economic life cycle of 30 years for an aeroplane, the proportion of magnetic tape FDRs on board aeroplanes was expected to decrease by 10% every 3 years. With this assumption, by 1 January 2019 the proportion of aeroplanes fitted with a magnetic tape FDR was estimated to be close to 0%. Therefore, requiring the replacement of magnetic tape FDRs for a few residual in-service aeroplanes was considered not to be justified. To this date, the number of aeroplanes of EASA Member State operators potentially carrying magnetic tape FDRs is minimal.

Furthermore, the continued serviceability of the FDR is addressed by paragraph (b) of CAT.GEN.MPA.195 of Annex IV (Part-CAT) of Commission Regulation (EU) No 965/2012, which states:

'The operator shall conduct operational checks and evaluations of the recordings to ensure the continued serviceability of the flight recorders which are required to be carried under this Regulation.'

The related Acceptable Means of Compliance AMC1 CAT.GEN.MPA.195 (b) specifies that the recordings of the FDR should be inspected by the operator at regular time intervals in order to detect and address any issue with the quality of the recording. The duration of these time intervals vary depending on the assumed reliability of the recording technology in use: every year for a magnetic-tape FDR and every two years for a solid-state FDR. This provides a system of recording inspections with different periodicities to account for differences in reliability between recording technologies. Compliance by operators with CAT.GEN.MPA.195 (b) is essential for ensuring the quality of FDR recordings.

Status: Closed

United States

Registration	Aircraft Type	Location	Date of event	Event Type
N350LH	AEROSPATIALE AS350	New York, Manhattan, Upper East Side, East River near Roosevelt Island	11/03/2018	Accident

Synopsis of the event:

On March 11, 2018, about 19: 08 eastern daylight time, an American Eurocopter Corp (Airbus Helicopters) AS350B2, N350LH, was substantially damaged when it impacted the East River and subsequently rolled inverted after the pilot reported a loss of engine power near New York. The pilot egressed from the helicopter and sustained minor injuries. The five passengers did not egress and were fatally injured.

Safety Recommendation UNST-2020-035:

After the actions requested in Safety Recommendation A-19-32 are completed, require owners and operators of existing AS350-series helicopters to incorporate the changes.

(SR A-19-32 To Airbus:
Modify the floor-mounted FSOL in AS350-series helicopters to include protection from inadvertent activation due to external influences.)

Reply No 1 sent on 22/06/2020: Once actions requested by the National Transportation Safety Board (NTSB) to Airbus Helicopters (AH) in the framework of the Safety Recommendation UNST-2020-032 are completed, i.e. to modify the floor-mounted Fuel Shut-Off Lever (FSOL) to protect it from inadvertent activation due to external influences, the European Union Aviation Safety Agency (EASA) will consider the improved FSOL design and will determine how to address the in-service retrofit for the affected AS350 helicopter models as necessary.

Status: Open

Malta

Registration	Aircraft Type	Location	Date of event	Event Type
		MALTA INTERNATIONAL AIRPORT	17/01/2019	Serious incident

Registration	Aircraft Type	Location	Date of event	Event Type
EI-DHW TC-JHM	BOEING 737BOEING 737	LMML (MLA) : Malta/Luqa	17/01/2019	Serious incident

Synopsis of the event:

Loss of separation on ground.

Safety Recommendation MALT-2019-002:

It is recommended that the FAA and EASA reassess the need for mandatory winglet tip proximity warnings (for B737-800 comparable winglets), together with additional pilot aids and anti-collision aids on the ground.

Reply No 1 sent on 18/12/2019: The European Union Aviation Safety Agency will contact the FAA to jointly assess the safety issue highlighted by this safety recommendation.

Reply No 2 sent on 22/09/2020: The European Union Aviation Safety Agency (EASA) acknowledges the Maltese Bureau of Air Accident Investigation (BAAI)'s concern regarding aircraft collisions with obstacles or between aircraft during taxi operations and has examined the potential safety benefit and feasibility of this Safety Recommendation.

These ground collision occurrences, whilst resulting in damage to the aircraft involved, and sometimes to aerodrome infrastructure, do not result in any passenger or ground personnel injuries. From a safety risk management perspective, the limited safety benefit of a taxi anti-collision system or aid does not justify the mandating of their installation on all large aircraft.

In regard to additional pilot aids and anti-collision aids on the ground, EASA will assess the adequacy of existing aids in order to explore other ground solutions complemented

by the optimisation of operational procedures.

Reply No 3 sent on 14/12/2020: The European Union Aviation Safety Agency (EASA) acknowledges the Maltese Bureau of Air Accident Investigation (BAAI)'s concern regarding aircraft collisions with obstacles or between aircraft during taxi operations and has examined the potential safety benefit and feasibility of this safety recommendation.

These ground collision occurrences, whilst resulting in damage to the aircraft involved, and sometimes to aerodrome infrastructure, do not result in any passenger or ground personnel injuries. From a safety risk management perspective, the limited safety benefit of a taxi anti-collision system or aid does not justify the mandating of their installation on all large fixed wing aircraft.

With regard to additional pilot aids and anti-collision aids on the ground, EASA has assessed, and found adequate, the existing aerodrome (ADR) design (DSN) certification specifications (CS) contained in CS-ADR-DSN Issue 4 (refer to Executive Director (ED) Decision 2017/021/R), which aim to ensure adequate clearance distances between certain types of aircraft and establish provision of the necessary visual cues. The CS and their guidance material (GM) are in line with the International Civil Aviation Organization (ICAO) Annex 14 'Aerodromes', Volume I 'Aerodrome Design and Operations'.

With regards to operational mitigation, EASA will consider this safety issue within the context of rulemaking task RMT.0591 'Regular update of the aerodrome rules'. The planning milestones for this task will be provided in the upcoming European Plan for Aviation Safety (EPAS) 2021-2025.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
N264DB	PIPER PA46	22 nm N-NW from EGJB (GCI) : Guernsey	21/01/2019	Accident

Synopsis of the event:

At 21:22 hrs on 21 January 2019, the AAIB was informed that a Piper PA-46-310P Malibu aircraft, had been lost from radar in transit from Nantes, France, to Cardiff in the UK, and that a surface search for survivors was underway using assets from the Channel Islands, UK and France. The wreckage of the aircraft had not been located by the time the official search ended at 1515 hrs on 24 January 2019, and the event therefore became classed as an aircraft accident under the terms of Annex 13 to the Convention on International Civil Aviation1. There were two persons on board the aircraft but neither was found by the surface search.

The wreckage was located on 3 February 2019 on the seabed approximately 22 nm north-north-west of Guernsey, within 100 m of the last secondary radar point recorded by the radar at Guernsey and at a depth of 68 m. There was one body present in the wreckage, which was recovered. The body was subsequently identified as that of the passenger.

Safety Recommendation UNKG-2020-001:

Safety Recommendation UNKG-2020-001 (AAIB): It is recommended that the European Union Aviation Safety Agency require piston engine aircraft which may have a risk of carbon monoxide poisoning to have an Co detector with an active warning to alert pilots to the presence of elevated levels of carbon monoxide.

Reply No 1 sent on 10/06/2020: Prompted by the preliminary results of the Air Accidents Investigation Branch (AAIB) investigation, the European Union Aviation Safety Agency (EASA) has published the Safety Information Bulletin (SIB) No. 2020-01 'Carbon Monoxide (CO) Risk in Small Aeroplanes and Helicopters' on 27 January 2020.

The aim of the SIB is to inform Type Certificate and Supplemental Type Certificate holders, maintenance personnel, owners and operators of small aeroplanes (CS-LSA, CS-VLA and CS-23) and light helicopters (CS-27) with internal combustion engines or combustion heaters about the dangers of exposure to CO and to provide

recommendations relating to the prevention, the detection and the reactions against CO exposure.

The SIB also refers to several related publications from the AAIB, the UK Civil Aviation Authority (CAA) and EASA.

In addition, the European Plan for Aviation Safety (2020-2024) includes a regular update of the air operational rules (rulemaking task RMT.0392) to ensure efficiency and proportionality of the regulatory framework of Commission Regulation (EU) No 965/2012 laying down technical requirements and administrative procedures related to air operations. This regular update also addresses safety issues stemming from safety recommendations that are not subject of dedicated rulemaking tasks. The draft Terms of Reference (ToR) to RMT.0392 were sent for consultation to the EASA Advisory Bodies on 12 March 2020, with a provision stating that they could be further amended if new safety recommendations are published.

Therefore, EASA will amend the ToR to RMT.0392 to include safety recommendation UNKG-2020-001. The revised ToR are foreseen to be published in 2020 Q2.

Reply No 2 sent on 11/12/2020: Prompted by the preliminary results of the Air Accidents Investigation Branch (AAIB) investigation, the European Union Aviation Safety Agency (EASA) has published the Safety Information Bulletin (SIB) No. 2020-01 'Carbon Monoxide (CO) Risk in Small Aeroplanes and Helicopters' on 27 January 2020.

The aim of the SIB is to inform Type Certificate and Supplemental Type Certificate holders, maintenance personnel, owners and operators of small aeroplanes (CS-LSA, CS-VLA and CS-23) and light helicopters (CS-27) with internal combustion engines or combustion heaters about the dangers of exposure to CO and to provide recommendations relating to the prevention, the detection and the reactions against CO exposure.

The SIB also refers to several related publications from the AAIB, the UK Civil Aviation Authority (CAA) and EASA.

In addition, the European Plan for Aviation Safety (EPAS 2020-2024) includes a regular update of the air operational rules (rulemaking task RMT.0392) to ensure efficiency and proportionality of the regulatory framework of Commission Regulation (EU) No 965/2012 laying down technical requirements and administrative procedures related to air operations. The associated Terms of Reference (ToR) were published on the EASA website on 07 October 2020, and, as stated on page 2 of the ToR, this safety recommendation will be considered within the framework of this RMT. See the following link to the ToR:

https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0392

The EPAS 2020-2024 indicates a planning milestone of 2021 Q1 for the associated Notice of Proposed Amendment (NPA). It should be noted that, depending on the complexity of

the topics, several NPAs may be published in steps towards that target date.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-WLTS	BELL 429	Melksham Heliport	02/01/2019	Serious incident

Synopsis of the event:

Uncommanded yaw pedal input on ground on arrival

Safety Recommendation UNKG-2020-011:

Safety Recommendation UNKG-2020-011 (AAIB): The STC holder that carried out the Minor Change made no reference in the work package to the fact that the audio controller interfaced directly with the CVR system. There was, perhaps, an indirect reference to the CVR system in the audio controller installation manual that said that the factory-set audio levels may need to be adjusted to 'best suit the local operating environment'. There was, however, no evidence to suggest this had been done because the output levels of the audio controller had not been altered.

If the newly installed equipment interfaces with other existing equipment on an aircraft, then tests must be conducted to ensure the installation has not had a detrimental effect on the existing equipment. EASA specifically reminds Minor Change applicants of this in guidance contained in their 'Minor Change Certificate Document'. The document is aimed at applicants making changes to GA aircraft, and especially those who are not DOA holders and who may have limited experience in the change process. There is, however, no equivalent guidance, or even reminder, to organisations qualified and practised in carrying out changes to CAT aircraft, leaving the potential for these tests to be overlooked and the continued airworthiness of the aircraft to be compromised.

Therefore, the following safety recommendation is made:
It is recommended that the European Union Aviation Safety Agency remind Minor Change applicants of the importance of verifying that new equipment does not have a detrimental effect on existing equipment with which it has a direct interface.

Reply No 1 sent on 27/07/2020: The European Union Aviation Safety Agency (EASA) will undertake both corrective and preventive actions.

First, a dedicated inspection will be performed on the relevant Design Organisation Approval (DOA) holder, with particular attention given to the aspects pertinent to this serious incident.

Second, a safety-promotion article will be published in EASA's Certification & Design Newsletter, to highlight that the installation of certain equipment needs an electromagnetic and audio interference test, as part of the compliance demonstration, before the approval change.

An update will be sent to the Air Accidents Investigation Branch once these actions have been performed.

Status: Open

Russian Federation

Registration	Aircraft Type	Location	Date of event	Event Type
A6-FDN	BOEING 737	URRR - Rostov na Donu	19/03/2016	Accident

Synopsis of the event:

On March 19, 2016 a Boeing 737-800 aircraft registered A6-FDN operated by Fly Dubai, while executing a recurrent approach at night time in IMC at Rostov-on-Don Airdrome with landing heading 218°, the crew went around from the height of 220 m (4.5 KM before the runway) with vertical speed of up to 20 mps setting the engines to max takeoff/goaround thrust. Both approaches (from the height of about 600 m) were performed with autopilot and autothrottle disengaged in flight director mode without significant heading or altitude deviations from the glideslope.

In the course of the go-around the crew set flaps to 15° and retracted the landing gear. At a height of 1900 ft, after reaching a pitch of 18°, the PF pushed on the control column, which led to a decrease in vertical acceleration of up to 0.5, increase in forward speed and, consequentially, automatic retraction of flaps from 15° to 10° at a speed of over 200 kt. The short term decrease in engine thrust within 3 seconds resulted in decreasing speed and flap extension to 15°, although the following crew inputs to regain max takeoff/goaround thrust led to speed increase and reiterated automatic flaps retraction to 10°. The flaps remained in the latter configuration until impact.

The PF, by pulling up the control column, continued climbing with a vertical speed of as much as 16 mps. At a height of 900 m, there was a simultaneous control column nose down input and stabilizer nose down deflection from -2.5 deg to +2.5 deg (the FDR recorded a nose down stabilizer input from the stabilizer trim switch of the control wheel lasting 12 sec), as a result the aircraft, having climbed to about 1000 m, turned into descent with negative vertical acceleration of -1g.

The following crew recovery actions did not allow to hit the runway about 120 m from the threshold with a speed of over 600 km/h and over 50° nose down pitch. Aircraft flight path is described in Fig. 1.

The accident destroyed the aircraft and killed the crew (7) and the passengers (55).

Safety Recommendation RUSF-2019-007:

It is recommended that FAA, the other certification authorities (EASA, IAC Aviation Register, FATA etc.) consider the practicability of the amendment of the aviation regulations with the provisions on the mandatory flight assessment of the flight parameters indication systems to pilots into the entire operating range of the aircraft with such systems installed.

Reply No 1 sent on 21/02/2020: Flight Guidance Systems (FGS), including Head Up Displays (HUD), that are installed on large aeroplanes must comply with Certification Specification CS 25.1301(a)(1) and CS 25.1329(i).

CS 25.1301(a)(1) requires that the FGS be of a kind and design appropriate to its intended function. This includes FGS display modes used for unusual attitudes.

CS 25.1329(i) requires that FGS functions, controls, indications, and alerts are designed to minimise flight crew errors and confusion concerning the behaviour and operation of the FGS.

Regarding HUDs that are the primary focus of the investigation report and led to this safety recommendation, Acceptable Means of Compliance AMC N°1 to CS 25.1329 includes the following elements:
-In section 9.4.5 Upset/Unusual Attitude Recovery Guidance:
"If the HUD is designed to provide guidance for recovery from upsets or unusual attitudes, recovery steering guidance commands should be distinct from, and not confused with, orientation symbology such as horizon "pointers." For example, a cue for left stick input should not be confused with a cue indicating direction to the nearest horizon. Guidance should be removed if cues become invalid at extreme attitudes, such as zenith, nadir, or inverted. For extreme attitudes it is acceptable to transition to the HDD, provided that the cues to transition from the HUD are clear and unambiguous.
If the HUD is designed to provide orientation only during upsets or unusual attitudes, cues should be designed to prevent them from being mistaken as flight control input commands."
-In section 14. Compliance demonstration using flight test and simulation, 14.1.4.1 Specific Demonstrations for Head-Up Display:
"If recovery guidance is provided, it should be demonstrated that the pilot could immediately detect and recover from unusual attitudes when using the HUD. Specialized unusual attitude recovery symbology, if provided, should be shown to provide unequivocal indications of the attitude condition (e.g. sky/ground, pitch, roll, and horizon) and to correctly guide the pilot to the nearest horizon. The stroke presentation of flight information on a HUD may not be as inherently intuitive for recognition and recovery as the conventional head down attitude display (e.g. contrasting colour, area fill, shading vs. line strokes). The HUD display design needs to be able to compensate for these
differences to provide adequate pilot recognition and recovery cues."

EASA considers that CS-25 already contains adequate certification specifications and acceptable means of compliance to ensure that adequate flight tests are performed addressing the ‘entire operating range’ of installed ‘flight parameters indication systems’, in particular HUDs, including upset or unusual attitude modes.

Status: Closed

Russian Federation

Registration	Aircraft Type	Location	Date of event	Event Type
A6-FDN	BOEING 737	URRR - Rostov na Donu	19/03/2016	Accident

Synopsis of the event:

On March 19, 2016 a Boeing 737-800 aircraft registered A6-FDN operated by Fly Dubai, while executing a recurrent approach at night time in IMC at Rostov-on-Don Airdrome with landing heading 218°, the crew went around from the height of 220 m (4.5 KM before the runway) with vertical speed of up to 20 mps setting the engines to max takeoff/goaround thrust. Both approaches (from the height of about 600 m) were performed with autopilot and autothrottle disengaged in flight director mode without significant heading or altitude deviations from the glideslope.

In the course of the go-around the crew set flaps to 15° and retracted the landing gear. At a height of 1900 ft, after reaching a pitch of 18°, the PF pushed on the control column, which led to a decrease in vertical acceleration of up to 0.5, increase in forward speed and, consequentially, automatic retraction of flaps from 15° to 10° at a speed of over 200 kt. The short term decrease in engine thrust within 3 seconds resulted in decreasing speed and flap extension to 15°, although the following crew inputs to regain max takeoff/goaround thrust led to speed increase and reiterated automatic flaps retraction to 10°. The flaps remained in the latter configuration until impact.

The PF, by pulling up the control column, continued climbing with a vertical speed of as much as 16 mps. At a height of 900 m, there was a simultaneous control column nose down input and stabilizer nose down deflection from -2.5 deg to +2.5 deg (the FDR recorded a nose down stabilizer input from the stabilizer trim switch of the control wheel lasting 12 sec), as a result the aircraft, having climbed to about 1000 m, turned into descent with negative vertical acceleration of -1g.

The following crew recovery actions did not allow to hit the runway about 120 m from the threshold with a speed of over 600 km/h and over 50° nose down pitch. Aircraft flight path is described in Fig. 1.

The accident destroyed the aircraft and killed the crew (7) and the passengers (55).

Safety Recommendation RUSF-2019-008:

Safety Recommendation RUSF-2019-008 (AIB): It is recommended that FAA, the other certification authorities (EASA, IAC Aviation Register, FATA etc.) consider the practicability of the amendment of the aviation regulations that determine the procedure of the STC issue for the indication systems to pilots, with the requirement to the manufacturer of the equipment in question to have the hardware/software package available to reproduce the indication as per the FDR data in real time and in the scope, sufficient for the investigation of the aircraft accidents and incidents.

Reply No 1 sent on 21/02/2020: International Civil Aviation Organization (ICAO) standards were adopted in 2018 that address the recording of information displayed to the flight crew on board large aeroplanes, in section 6.3.4 of Annex 6 Part I (refer to Annex 6, amendment No 1-43, applicable on 8 November 2018):

'6.3.4 Flight crew-machine interface recordings
6.3.4.1 Applicability
6.3.4.1.1 All aeroplanes of a maximum take-off mass of over 27 000 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 shall be equipped with a crash-protected flight recorder which shall record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew as defined in Appendix 8.'

Appendix 8 to Annex 6, section 6.3 provides more detail on the applications to be recorded:
'6.3.3 The recording of the information displayed to the flight crew from electronic displays shall include the following:
— primary flight and navigation displays;
— aircraft system monitoring displays;
— engine indication displays;
— traffic, terrain, and weather displays;
— crew alerting systems displays;
— stand-by instruments; and
— installed EFB to the extent it is practical."

The information to be recorded could be acquired by different means, such as screen capturing at the level of the electronic display or using an airborne image recorder.

In order to support the implementation of this Standard, the ICAO flight recorder specific working group (FLIREC-SWG) agreed at their latest meeting in October 2019 that some aspects need to be addressed in an international industry standard, such as EUROCAE document 112A (Minimum Operational Performance Specifications for Crash Protected Airborne Recorder Systems).
EUROCAE is currently processing the proposal to revise ED-112A that was submitted by EASA in January 2020.

Once an international industry standard for flight crew-machine interface recordings is available, EASA will consider the implementation of the above mentioned ICAO standard using the standing rulemaking task for regular updates of the air operations regulation.

Status: Open

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-GEAL	PITTS S2	MEAUX ESBLY Airport - France - LFPE.	#Missing#	Accident

Synopsis of the event:

Le 8 decembre 2013, le pilote, aux commandes d'un Pitts $2-B a moteur Lycoming AEIO-540 et helice bipale metallique Hartzell, decolle pour un vol de voltige lors duquel il realise plusieurs figures qui entrainent une variation rapide de l'orientation de l'axe de rotation de I'helice.
De retour du vol, en vent arriere, le pilote ressent des vibrations dont l'intensite augmente. Le pilote reduit la puissance du moteur et se declare en situation d'urgence. L'ensemble forme par I'helice et une partie du vilebrequin se desolidarise du moteur et heurte la derive. Constatant l'apparition de fumees et la presence d'huile sur le pare-brise de l'avion, le pilote arrete le moteur et realise un atterrissage force.
L'accident resulte de lafissuration progressive en fatigue puis la rupture du vilebrequin, due aux efforts de flexion rotative appliques lors de certaines manoeuvres de voltige par I'helice sur le vilebrequin. L'enquete a montre que l'utilisation conjointe de moteurs Lycoming AElO-540 et d'helices bipales metalliques Hartzell, lorsqu'ils sont utilises pour des vols de voltige comportant certaines manoeuvres avec un fort effet gyroscopique, constituait un facteur de risque accru de rupture du vilebrequin.

Safety Recommendation FRAN-2019-033:

le BEA recommande que:
Sans attendre l'action de la FAA, que l'AESA informe les exploitants des avions équipés des moteurs visés dans le bulletin de service n°482 de Lycoming et d'hélices bipales métalliques Hartzell, des risques de ruptures de vilebrequin associés à la pratique d'évolutions de voltige de type « unlimited ».

Reply No 1 sent on 02/03/2020: In accordance with paragraph M.A.302 of Commission Regulation (EU) No 1321/2014 on Continuing Airworthiness, the aircraft maintenance programme must establish compliance with the instructions issued by the competent authority and with the instructions for continuing airworthiness issued by the holders of the type-certificate. The aircraft maintenance programme shall contain details, including frequency, of all maintenance to be carried out, including any specific tasks linked to the type and the specificity of operations.

The oversight of individual aircraft airworthiness, and of aircraft maintenance programmes, is under the responsibility of the competent authorities of the Member States (National Aviation Authority NAA). The aircraft maintenance programme is based

upon the relevant chapters of the maintenance manual, or any other maintenance data containing information on scheduling. Per Acceptable Means of Compliance (AMC) M.A.401 (b), service bulletins belong to the maintenance data which must be accessed and used by the owner or operator, and upon which the maintenance programme should normally be based.

A subscription to a technical publisher that provides maintenance data (Aircraft Maintenance Manuals, Illustrated Parts Catalogues, Service Bulletins, etc.), need to be described in the continuing airworthiness management exposition which is required to be approved by the NAA. Accordingly, the European Union Aviation Safety Agency (EASA) is not responsible for informing the operators about of the risks of crankshaft rupture described in Lycoming service bulletin No 482, nor is EASA responsible for informing the operators about any other service bulletin, except when they are referenced by an EASA Airworthiness Directive.

Furthermore, in December 2019, the Federal Aviation Administration (FAA) has completed a risk assessment on the issue addressed by Lycoming service bulletin No 482, which was published in June 1988, and determined that an Airworthiness Directive is not justified. EASA agrees with this position.

Status: Closed

Italy

Registration	Aircraft Type	Location	Date of event	Event Type
I-6430	TECNAM P92 (E)	Calatabiano (CT)	11/09/2018	Accident

Synopsis of the event:

Total loss of power after take-off, impact with terrain.

Safety Recommendation ITAL-2020-003:

Safety Recommendation ITAL-2020-003 (ANSV): ANSV recommends evaluating the introduction on certified BRP-Rotax engines of type 912 / series and 914, and those equipped with the type of oil tank installed on the aircraft involved in the accident, of a technical solution aimed at avoiding the possibility of an accidental inversion of the "in" and "out" pipes of the lubricating oil, and advising the maintenance operators about the risk of encountering such an error.
ANSV asks EASA to sensitize BRP-Rotax to the need to introduce the above mentioned technical solution also on the same type of engines that are not certified.

Reply No 1 sent on 19/06/2020: The safety investigation of Agenzia Nazionale per la Sicurezza del Volo (ANSV) has established that, following a maintenance operation which included a cleaning of the engine oil tank, the oil pipes had been incorrectly re-installed. This resulted in insufficient lubrication of the engine which failed during the first flight following the maintenance operation. As noted in the investigation report, the cleaning of the engine oil tank is a maintenance task instructed in the engine's Maintenance Manual Line (MML). The last step in this task is the "purge of the oil system", which must be performed in accordance with the Service Instruction which is referenced in the MML. The correct execution of this purging task allows verification of the proper operation of the engine lubrication system. In several locations within the Rotax instructions, maintenance operators are warned about the importance of correct maintenance of the engine's lubrication system for preventing engine failures.

The loss of oil pressure, whatever the reason, is a well-known potential cause of engine failure. This justifies the requirement for an engine oil pressure indicator, or warning, which exists in the European Union Aviation Safety Agency (EASA) Certification Specifications (CS), for example in CS 23.2615, CS 22.1305(d) and CS-VLA 1305(b). Rotax Operators' Manuals for engine types 912 and 914 both instruct, during the engine starting sequence, to check if the oil pressure has risen within 10 seconds, and to monitor this oil pressure, as soon as the engine runs. According to the same manuals, an

increase of the engine speed for take-off is only permitted at steady oil pressure readings above 2 bar (30 psi). The investigation report indicates that the aircraft flight manual includes a verification of the engine oil pressure immediately after engine starting and before take-off. The results of these checks, however, are not provided in the investigation report.

In Rotax's letter of 6 February 2020, addressed to the Austrian Ministry of Transport and copied to the EASA Project Certification Manager (PCM), Rotax provided their comments on the ANSV's draft final report and indicated that more than 50,000 4-stroke aircraft engines have been delivered, and, to their knowledge, this accident is the only one caused by incorrectly installed oil lines. Rotax also stated that the incorrect installation of the oil tank lines would result in 0 bar oil pressure indication which would prevent satisfactory completion of the “purge of the oil system” task.

Considering the EASA CS requirements and Rotax's already published instructions for continuing airworthiness applicable to the engine oil system (available at www.flyrotax.com), and considering that the current marking of the oil tank connections clearly indicate that they are not interchangeable, EASA concludes that introducing a technical solution aimed at avoiding the possibility of an accidental inversion of the “in” and “out” pipes for the lubricating oil, and advising the maintenance operators about the risk of encountering such an error, would not appreciably increase the current level of safety and would be a disproportionate measure.

Status: Closed

United States

Registration	Aircraft Type	Location	Date of event	Event Type
N772SW	BOEING 737	105 km (65.6 mls) NW of Philadelphia,	17/04/2018	Accident

Synopsis of the event:

A Boeing 737-700, experienced a failure of the left CFM International CFM-56-7B engine and loss of engine inlet and cowling during climb about flight level 320. Fragments from the engine inlet and cowling struck the wing and fuselage, resulting in a rapid depressurization after the loss of one passenger window. The flight crew conducted an emergency descent and diverted into Philadelphia International Airport (KPHL), Philadelphia, Pennsylvania. Of the 144 passengers and five crewmembers onboard, one passenger received fatal injuries and eight passengers received minor injuries. The airplane sustained substantial damage.

Safety Recommendation UNST-2019-007:

Expand your certification requirements for transport-category airplanes and aircraft engines to mandate that airplane and engine manufacturers work collaboratively to
(1) analyze all critical fan blade impact locations for all engine operating conditions, the resulting fan blade fragmentation, and the effects of the fan-blade-out-generated loads on the nacelle structure and
(2) develop a method to ensure that the analysis findings are fully accounted for in the design of the nacelle structure and its components.

Reply No 1 sent on 21/02/2020: EASA has initiated a review of CS-E and CS-25 and is reviewing the options available to address this safety recommendation in the most efficient way.
An update will be provided once this action has progressed.

Status: Open

Iran, Islamic Republic of

Registration	Aircraft Type	Location	Date of event	Event Type
EP-ATG	FOKKER F28	OICI : Ilam	22/03/2019	Serious incident

Synopsis of the event:

The aircraft was performing a flight from Tehran Mehrabad to Ilaam (Iran) with 81 passengers and 8 crew, was on approach to Ilaam when the crew selected the gear down, however, the right main gear did not deploy. The crew recycled the landing gear, however, without success. The crew went around, however the left main gear could not be retracted. The crew decided to divert to Kermanshah with the left main gear remaining extended, due to lack of maintenance facilities available at Kermanshah the crew subsequently decided to continue back to Tehran. On approach to Tehran the right main gear unlocked using the normal gear extension, manual extension had not yet been used, and the crew received an all gear down and locked indication. The aircraft continued for a normal landing on Mehrabad's runway 29L about 2:10 hours after departure from Tehran.

Safety Recommendation IRAN-2020-001:

To mandate Fokker Service to notify all F100 operators/pilots about findings of the incident via safety letter and guide preventative actions accordingly with reference of time delay for LG operation.

Reply No 1 sent on 30/04/2020: The European Union Aviation Safety Agency (EASA) has the remit to issue Airworthiness Directives (ADs), which are documents issued to mandate actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may otherwise be compromised (ref. § 21.A.3B (a) of Commission Regulation (EU) 748/2012).

Regarding the design of the F100 hydraulic system, EASA has already taken the necessary actions to enhance its robustness, including (but not limited to) mandating the introduction of the improvements described in EASA AD 2018-0076 and EASA AD 2019-0104, as mentioned in the accident investigation report by the Islamic Republic of Iran Civil Aviation Organisation Aircraft Accident Investigation Board.

It is outside of EASA's remit to require any Type Certificate Holder to issue a safety letter, as this type of publication cannot directly contain mandatory instructions regarding the actions to be performed on an aircraft to restore an adequate level of safety.

However on March 26th 2019 Fokker Services issued an All Operators Message, ref AOF100.220, drawing operators' attention to the subject event. Fokker has also advised EASA about their intention to update this All Operators Message with the results and recommendations contained in the final safety investigation report.

Status: Open

China

Registration	Aircraft Type	Location	Date of event	Event Type
B-6419	AIRBUS A319	over Chengdu	13/05/2018	Serious incident

Synopsis of the event:

40 minutes after take-off, the right side windshield was released (lost) in cruise. The cabin Oxygen masks fell down; flight crew declared MAYDAY and squawked the A7700. The aircraft diverted to CTU. After landing, #3 and #4 MLG tires burst.

Safety Recommendation CHIN-2020-001:

SWCAAC-ASR-2018-1-6 Recommends that EASA consider revision of AMC 25.775(d)[particularly section 7.c (6)] to require the relevant FHA/SSA, and their documentation, in order to evaluate the consequences of windshield heating system failures in terms of the structural integrity of the windshield and the potential subsequent effect(s) at aircraft level, including, as needed, the necessary testing to support and validate these evaluations. This recommendation also includes considering the practicality of updating AMC 25.775(d) Section 7.c (6) to extend the notion of transparency among the effects associated with loss of the windshield, rather than only to the loss of the heating function.

Reply No 1 sent on 11/08/2020: The European Union Aviation Safety Agency (EASA) has initiated a review of this incident and the related Certification Specification CS-25 provisions. Several options are being evaluated to address this safety recommendation.

An update will be provided once this action has progressed.

Reply No 2 sent on 03/03/2021: In the frame of rulemaking task RMT.0673 ('Regular update of CS-25') the European Union Aviation Safety Agency (EASA) published notice of proposed amendment (NPA) 2020-11 on 26 November 2020 that takes into account this safety recommendation.
https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-11

The NPA proposes to amend acceptable means of compliance AMC 25.775(d) to ensure that applicants better address failure conditions that may have structural effects. Although differently worded, the proposal is understood to meet the intent of the safety recommendation. A new section 8 is proposed that reads as follows:
"AMC 25.1309, Chapter 10, paragraph (c) on 'Considerations When Assessing Failure Condition Effects', states that the severity of failure conditions should be evaluated taking into account the effects on the aeroplane from potential or consequential effects on structural integrity.
The applicant should therefore carefully take into account the potential effects on the windshield structural integrity when assessing any failure condition related to systems associated with the windshield (such as windshield heating systems).
Unless otherwise demonstrated by the applicant, a failure condition that leads to a structural failure of a windshield should be classified as at least hazardous.
In addition, certification specification CS 25.365(e)(3) requires the consideration of the maximum opening caused by aeroplane or equipment failures (such as windshield failures) that is not shown to be extremely improbable.
Service experience has shown that the failure or the deterioration of some windshield installation components (such as a degraded seal), combined with environmental conditions (such as the accumulation of water or moisture ingress) or with manufacturing/installation issues, may lead to the failures of other components of a system associated with the windshield (such as degradation of, or damage to, the insulation of a heating system wire). The combination of these failures may then lead to a malfunction or failure of the associated system that may then lead to a structural failure of the windshield.
The applicant should therefore pay particular attention to common cause and cascading failures, and identify appropriate design, manufacturing, installation and maintenance precautions for the installation of windshields and the associated systems that mitigate the risk of any failure condition adversely affecting other adjacent systems or components that may lead to a structural failure of the windshield. Such considerations are generally expected to be addressed through zonal safety analysis (refer to AMC 25.1309, Appendix 1)."
Further information will be provided once EASA will have reviewed the comments received from stakeholders and prepared an ED Decision amending CS-25.

Status: Open

United Arab Emirates

Registration	Aircraft Type	Location	Date of event	Event Type
G-MDME HS-THK	DIAMOND (DA62) DIAMOND (DA62)AIRBUS A350	about 3 miles south of OMDB (DXB) : Dubai	16/05/2019	Accident

Synopsis of the event:

A Diamond DA-62 aircraft, was involved in a fatal accident while on approach to runway 30L of Dubai International Airport for a ground navigation equipment inspection flight. Video footage showed the aircraft encountered possible wake turbulence at about 1,100 ft, following an Airbus A350, which landed on the parallel runway 30R.

Safety Recommendation UNAR-2020-001:

Review the requirements to register commercial operations under EASA Part-SPO Specialised Operations, to ensure that national civil aviation authorities, adopting these requirements, are provided with essential applicant information to enable an effective initial assessment of potential operational risks.

Reply No 1 sent on 24/08/2020: Commission Regulation (EU) No 965/2012 laying down technical requirements and administrative procedures related to air operations was amended by Commission Regulation (EU) No 379/2014 in order to introduce, among others, requirements applicable to specialised operations (Annex VIII - Part-SPO) and to the oversight by competent authorities of operators conducting such operations. Regulation (EU) No 379/2014 stipulated that these new requirements become applicable on 1 July 2014, with the possibility for Member States not to apply them until 21 April 2017 by way of derogation. Almost all Member States (including the UK) used this possibility and deferred the applicability date until 21 April 2017.

In 2018 and 2019, the European Union Aviation Safety Agency (EASA) monitored the application by competent authorities of the requirements related to the oversight of high-risk SPO operators in several Member States. This was done through desktop reviews and inspections using a risk-based approach, as laid down in Commission Regulation (EU) No 628/2013 on working methods of the European Aviation Safety Agency for conducting standardisation inspections and for monitoring the application of the rules of the Basic Regulation.

EASA intended to present the results of this monitoring during the biannual Air Operations meeting gathering representatives of all EASA Member States to be held in May 2020. Amongst others, the aim of the presentation was to identify if further actions should be conducted with regard to the oversight of SPO operators, either by means of regulatory amendments or safety promotion, in order to ensure a safe and harmonised implementation of Part-SPO in Member States.

However, due to the COVID-19 pandemic, the meeting was cancelled. The results of the review, together with the main conclusions of the investigation into the DA62 registered G-MDME and safety recommendation UNAR-2020-001, will be presented for further actions at the next biannual Air Operations meeting to be held in autumn 2020.

Status: Open

United Arab Emirates

Registration	Aircraft Type	Location	Date of event	Event Type
G-MDME HS-THK	DIAMOND (DA62) DIAMOND (DA62)AIRBUS A350	about 3 miles south of OMDB (DXB) : Dubai	16/05/2019	Accident

Synopsis of the event:

A Diamond DA-62 aircraft, was involved in a fatal accident while on approach to runway 30L of Dubai International Airport for a ground navigation equipment inspection flight. Video footage showed the aircraft encountered possible wake turbulence at about 1,100 ft, following an Airbus A350, which landed on the parallel runway 30R.

Safety Recommendation UNAR-2020-002:

Introduce regulation requiring airborne image and audio recording systems in commercially operated light aircraft.

Reply No 1 sent on 24/08/2020: The installation of recorders on-board light aeroplanes and helicopters, in accordance with the type of aircraft operation, was considered within the framework of the European Union Aviation Safety Agency (EASA) rulemaking tasks RMT.0271 and RMT.0272 'In-flight recording for light aircraft'.

EASA Opinion No 02/2019, contained proposed amendments to the air operations regulation stemming from RMT.0271 and RMT.0272. The resulting Commission Implementing Regulation (EU) 2019/1387 was published on 05 September 2019.

This regulation introduced a new rule extending the flight recorder carriage requirements to commercially operated aeroplanes that are first issued with an individual certificate of airworthiness on or after 05 September 2022, when they are turbine-engined with an MCTOM (Maximum Certified Take-Off Mass) of 2 250 kg or more and when they have a MOPSC (Maximum Operating Passenger Seating Configuration) of more than 9. Refer to Annex IV to Commission Regulation (EU) No 965/2012 (Part-CAT), CAT.IDE.A.191.

The outcome of the impact assessment conducted under RMT.0271 and RMT.0272 was that promoting voluntary installation of in-flight recording systems was the most appropriate way forward for all other cases (refer to EASA notice of proposed amendment 2017-03), based on principles of proportionality.

In order to facilitate such voluntary installation, the certification specifications for standard changes and standard repairs (CS-STAN) contain sub-paragraph CS-SC104a on the installation of lightweight in-flight recording systems. This allows a lightweight in-flight recording system to be installed on non-complex aeroplanes (such as the Diamond DA62) by the means of a standard change, i.e. by a qualified maintenance engineer, without requiring change approval by the relevant authority.

Status: Closed

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-DDGX	SCHEMPP HIRTH CIRRUS (Standard Cirrus 75)	South Wales Gliding Club airfield	27/07/2019	Accident

Synopsis of the event:

Horizontal stabiliser detached during ground run of an aero tow. Glider became airborne, pitched up, stalled and struck the ground vertically from a height of approximately 25 m.

Safety Recommendation UNKG-2020-013:

It is recommended that the European Union Aviation Safety Agency require a means to detect incorrect alignment of the tailplane locking lever on gliders with locking features similar to the Standard Cirrus 75.

Reply No 1 sent on 07/09/2020: The European Union Aviation Safety Agency (EASA) is investigating this issue in cooperation with the sailplane Type Certificate Holder (TCH) Schempp-Hirth and will revert back to the Air Accidents Investigation Branch once its assessment of this safety recommendation is complete.

Reply No 2 sent on : Following the European Union Aviation Safety Agency (EASA)'s investigation of this issue in cooperation with the sailplane Type Certificate Holder, Schempp-Hirth, an Airworthiness Directive (AD) AD-2020-0260 has been issued in order to address this issue linked to elevator attachment. Furthermore Safety Information Bulletin (SIB) SIB-2019-07 addressing sailplane rigging is being revised to add more examples. A further update will follow.

Status: Open

Italy

Registration	Aircraft Type	Location	Date of event	Event Type
I-CTAC	TECNAM P2002	Carlentini (Siracusa)	12/02/2020	Accident

Synopsis of the event:

During a PPL training mission, in which the crew was supposed to perform some spin recognition and avoidance maneuvers, the aircraft entered an uncontrollable spin and crashed on the ground. At the impact, the aircraft was caught on fire and both the flight instructor and the student pilot were fatally injured.

Safety Recommendation ITAL-2020-001:

To take appropriate initiatives to define a clear, full and unambiguous technical definition of "spin", "incipient spin" and "developed spin", similarly to what has been done by the FAA, in order to allow the flight training schools to limit operations of aircraft to missions and maneuvers for which they are certified, preventing confusion.
[[%_A133%]] - l'ANSV raccomanda di intraprendere le opportune iniziative per definire, in modo chiaro, completo ed univoco, cosa si intenda tecnicamente per "vite", "vite incipiente" e "vite sviluppata", a similitudine di quanto fatto dalla FAA, allo scopo di non creare confusione e permettere alle scuole di volo di utilizzare i velivoli soltanto per le esercitazioni e le manovre per cui gli stessi siano stati certificati.

Reply No 1 sent on 19/06/2020: The European Union Aviation Safety Agency (EASA) highlights that the following regulations and guidance material are applicable:

• ORA.ATO.135(a) in Annex VI (Part-ORA) to Commission Regulation (EU) 1178/2011 requires the approved training organisation (ATO) to use an adequate fleet of training aircraft for the training courses provided. Thus the ATO must demonstrate to its competent authority the suitability of the aircraft used for all (regulatory) exercises.
• GM3 FCL.010 Definitions for Upset Recovery Training (UPRT), provides definitions for "incipient spin", "developing spin", and "developed spin".
• GM4 FCL.010 Definitions related to the post-stall regime, explains that the definitions for 'incipient spin', developing spin' and 'developed spin' in GM3 FCL.010 relate to the post-stall regime in aeroplanes that might typically be used in the context of the advanced UPRT.

However, after an internal review EASA has decided to better clarify the purpose of exercise 11 under rulemaking task RMT.0678 titled `Simpler, lighter and better Part-FCL

requirements for general aviation', Subtask 2, for which the Notice of Proposed Amendment (NPA) is planned to be published in 2020/Q4.

Status: Open

Portugal

Registration	Aircraft Type	Location	Date of event	Event Type
CS-HFT	AEROSPATIALE AS350	near Valongo	05/09/2019	Accident

Synopsis of the event:

The helicopter crashed during a fire-fighting mission when it hit a power line. The pilot was fatally injured.

Safety Recommendation PORT-2020-001:

It is recommended that EASA follow its Rotorcraft Safety Roadmap publication principles, producing rulemaking documentation requiring retroactive application of the current improvements in fuel tank crash resistance for rotorcraft certified before the new certification specification for type design entered into force. Helicopters used for Commercial Operations shall be subject to this additional airworthiness requirement for operations.

Reply No 1 sent on 22/09/2020: This safety recommendation will be taken into account in the frame of rulemaking task RMT.0710 "Improvement in the survivability of rotorcraft occupants in the event of a crash".

This task is part of the European Plan for Aviation Safety (EPAS) 2020-2024. It will consider options for retroactive application of fuel tank crash resistance requirements.

Further information will be provided when the project is launched with the publication of its terms of reference.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
OE-LOA	AIRBUS A320	EGSS (STN) : London / Stansted	01/03/2019	Serious incident

Synopsis of the event:

Take-off rejected at low speed due to No 1 engine failure. Full evacuation on runway.

Safety Recommendation UNKG-2020-018:

It is recommended that the European Union Aviation Safety Agency commission research to determine how to prevent passengers from obstructing aircraft evacuations by retrieving carry-on baggage.

Reply No 1 sent on 12/11/2020: The safety issue "Emergency Evacuation" is included in the Safety Risk Portfolio (SRP) for large aeroplanes, as part of the European Union Aviation Safety Agency (EASA) Safety Risk Management (SRM) process (see the Annual Safety Review 2020, published on the EASA web site at: https://www.easa.europa.eu/newsroom-and-events/news/easa-publishes-annual-safety-review-asr-2020). The SRP is used to trigger the assessment of safety issues, to target analysis activities over key risk areas and to prioritise safety actions. This includes consideration of the exposure to the hazard and its predicted evolution in the coming years, the expected safety benefit of the mitigation recently implemented or committed, or recommended, and reprioritisation of actions where appropriate.

Passengers taking hand luggage preventing or slowing down the evacuation is one of the identified sub-set of associated risks.

The Emergency Evacuation safety issue is currently under development of recommendations for actions in accordance with the Best Intervention Strategy (BIS) process, with potential inclusion of the mitigating actions in the European Plan for Aviation Safety (EPAS). The recommendation, for EASA to commission research to determine how to prevent passengers from obstructing aircraft evacuations by retrieving carry-on baggage, will be considered within this process.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
OE-LOA	AIRBUS A320	EGSS (STN) : London / Stansted	01/03/2019	Serious incident

Synopsis of the event:

Take-off rejected at low speed due to No 1 engine failure. Full evacuation on runway.

Safety Recommendation UNKG-2020-019:

It is recommended that the European Union Aviation Safety Agency consider including a more realistic simulation of passenger behaviour in regard to carry-on baggage in the test criteria and procedures for the emergency demonstration in CS-25.

Reply No 1 sent on 12/11/2020: The aeroplane evacuation demonstration requirement in Certification Specification (CS) CS 25.803(c) and the test criteria and procedures in Appendix J to CS-25 are not intended to investigate all possible emergency evacuation scenarios that may occur in service. In particular, the emergency demonstration does not intend to take into account the impact from unruly passengers. The emergency demonstration provides a standard method for assessing the evacuation capability of the aeroplane and to demonstrate the effectiveness of crew emergency procedures and training.

The related test conditions and pass/fail criteria (e.g. the 90 seconds limit to the evacuation time) demonstrate that the aircraft design provides an acceptable level of performance in a standard evacuation scenario.

The simulation of passenger behaviour with regards to carry-on baggage would not provide appreciable added value in the evaluation of the aircraft design, and would result in an increased risk of injury for certification test participants.

The European Union Aviation Safety Agency (EASA) therefore does not deem it is appropriate to amend CS 25.803(c) and Appendix J to CS-25 as suggested by this safety recommendation.

Status: Closed

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-HPJE	AIRBUS A380	about 200nm southeast of Nuuk (Greenland)	30/09/2017	Serious incident

Synopsis of the event:

An Airbus A380-800, performing flight from Paris Charles de Gaulle (France) to Los Angeles,CA (USA) with 497 passengers and 23 crew, was enroute at FL370 about 200nm southeast of Nuuk (Greenland) when the fan and inlet of the #4 engine, outboard right hand) separated from the engine. The crew descended the aircraft to FL310 and diverted to Goose Bay,NL (Canada) for a safe landing.

Safety Recommendation FRAN-2020-006:

Safety Recommendation FRAN-2020-006 (BEA): EASA and the FAA ensure that the design and sizing criteria and methods along with the manufacturing processes and in-production checks of engine rotor-grade critical parts made of α/β titanium alloy, and in particular the titanium alloy Ti-6-4, are such that the risk of failure of these parts due to the cold dwell fatigue phenomenon is controlled.

Reply No 1 sent on 14/12/2020: The European Union Aviation Safety Agency (EASA) is working with the Federal Aviation Administration (FAA) and two Industry groups, the Aerospace Industries Association (AIA) Rotor Integrity Steering Committee (RISC) and the Jet Engine Titanium Quality Committee (JETQC), to address the safety issues of the recommendation. These complimentary teams will be considering industry practices for improved titanium alloy conversion practices and the characterization and quantification of titanium micro-texture, with the objective of a holistic design, manufacturing and lifing system. Concurrently, the EASA will work with its applicants to assess existing life limited part/critical part rotor designs. EASA will provide a follow-on response once our evaluation is complete.

Status: Open

France

Registration	Aircraft Type	Location	Date of event	Event Type
F-HPJE	AIRBUS A380	about 200nm southeast of Nuuk (Greenland)	30/09/2017	Serious incident

Synopsis of the event:

An Airbus A380-800, performing flight from Paris Charles de Gaulle (France) to Los Angeles,CA (USA) with 497 passengers and 23 crew, was enroute at FL370 about 200nm southeast of Nuuk (Greenland) when the fan and inlet of the #4 engine, outboard right hand) separated from the engine. The crew descended the aircraft to FL310 and diverted to Goose Bay,NL (Canada) for a safe landing.

Safety Recommendation FRAN-2020-008:

Safety Recommendation FRAN-2020-008 (BEA): EASA and the FAA carry out a review of engine rotor-grade critical parts made of α/β titanium alloy, and in particular the titanium alloy Ti-6-4, which undergo a manufacturing process likely to lead to the presence of intense macro-zones and for which the risk of failure due to a cold dwell fatigue phenomenon has not been sufficiently taken into account during the certification. EASA and the FAA will subsequently make sure, where appropriate, that an adapted in-service inspection programme is implemented to detect possible incipient cracks which might lead to the failure of the part.

Reply No 1 sent on 14/12/2020: The European Union Aviation Safety Agency (EASA) is working with the Federal Aviation Administration (FAA) and two Industry groups, the Aerospace Industries Association (AIA) Rotor Integrity Steering Committee (RISC) and the Jet Engine Titanium Quality Committee (JETQC), to address the safety issues of the recommendation. These complimentary teams will be considering industry practices for improved titanium alloy conversion practices and the characterization and quantification of titanium micro-texture, with the objective of a holistic design, manufacturing and lifing system. Concurrently, the EASA will work with its applicants to assess existing life limited part/critical part rotor designs. EASA will provide a follow-on response once our evaluation is complete.

Status: Open

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
ET-AUP	BOEING 787	Oslo airport Gardermoen - ENGM	18/12/2018	Serious incident

Synopsis of the event:

The right wing hit light pole during taxi at de-ice stand. The wing area of impact received visible damage to the leading edge and top/front of the wing skin itself.

Safety Recommendation NORW-2020-014:

The Accident Investigation Board Norway recommends that EASA consider to require large aircraft to be equipped with anti-collision aids for use during taxi.

Reply No 1 sent on 22/09/2020: The European Union Aviation Safety Agency (EASA) acknowledges the Accident Investigation Board Norway (AIBN)'s concern regarding large aircraft collisions with obstacles or between aircraft during taxi operations and has examined the potential safety benefit and feasibility of this Safety Recommendation.

These ground collision occurrences, whilst resulting in damage to the aircraft involved, and sometimes to aerodrome infrastructure, do not result in any passenger or ground personnel injuries. From a safety risk management perspective, the limited safety benefit of a taxi anti-collision system or aid does not justify the mandating of their installation on all large aircraft.

Status: Closed

Sweden

Registration	Aircraft Type	Location	Date of event	Event Type
SE-MES	GIPPSLAND GA8	ESNU (UME) : Umeå	14/07/2019	Accident

Synopsis of the event:

The purpose of the flight was to drop eight parachute jumpers from FL 130 (about 4,000 meters). Earlier during the day the pilot had made two parachute flights with the same aircraft. During the first flight, the parachute club's pilot was accompanied by an instructor pilot in the right seat for a routine check.
The pilot approached the airport and requested to get higher due to clouds, which was granted by the air traffic control without specifying a specific altitude. He then got the clearance from the air traffic control to drop the jumpers, which he confirmed. There was no further radio communication with the aircraft.
Radar data combined with wind data shows that the speed over the ground was declining as the aircraft rose to flight level 136 (about 4,200 meters). Then the aircraft suddenly changed direction to the left to contract rate and began to fall rapidly. The aircraft then traveled a short mile at the same time as it dropped about 1,500 meters, which is a diving of more than 45 degrees. From an altitude of 2,500 meters, the aircraft basically dropped straight down at a sinking speed of about 60 m/s.
Several films of the final phase of the course, taken from the ground, show that the fuselage, without wing and stabilizer, rotated in the horizontal plane with the left wing pointing upwards while the right wing was missing.
A witness to the accident saw at the scene that the rear cabin door was open, but found no signs of life among those on board.

Safety Recommendation SWED-2020-001:

Consider introducing a formal training programme for pilots in parachute operations

Reply No 1 sent on 07/12/2020: Depending on the specific nature of the undertaking, parachute operations in European Union Aviation Safety Agency (EASA) Member States are governed by Part-SPO (specialised operations) or Part-NCO (non-commercial operations with other-than complex motor-powered aircraft) of Commission Regulation (EU) No 965/2012, on air operations [see Article 6.4a(c) of the Cover Regulation and SPO.GEN.005(c)(2)].

According to SPO.OP.230 and NCO.SPEC.105, the operator/pilot-in-command (PIC) is required to carry out a risk assessment and establish standard operating procedures (SOPs) or checklists, respectively, to mitigate the risks related to the specific activity.

When developing the SOPs or checklists, the mitigation should be tailored according to the complexity of the operation, and should take into account the required piloting skills and level of experience [see AMC2 SPO.OP.230 and GM1 NCO.SPEC.105 (a)(2)]. For developing the checklist, the pilot-in-command should duly take into account minimum crew experience and training provisions, as well as recency provisions [see GM1 NCO.SPEC.105(c)((2) and (3)].

SOPs should include the following for flight crew members: selection criteria (initial qualification, flight experience, experience of the activity); initial training (volume and content of the training); recent experience requirement and/or recurrent training (volume and content of the training). For initial and recency training, the operational environment and the complexity of the activity should be detailed in the training programmes [see AMC2 SPO.OP.230(c)(2)]. The qualification and nomination of persons providing the training should also be included in the SOPs [See SPO.SPEC.PAR,100(c)].

Whilst a specific rating for flight crew is required for glider and banner towing according to Commission Regulation (EU) No 1178/2011 on aircrew, a specific flight crew rating for parachute operations is considered inappropriate, as these operations are within the normal flight envelope (as opposed to banner or glider towing were the aircraft characteristics are affected by the towed elements, and also considering pick-up of banner is critical).

Instead of mandating specific pilot training for parachute operations, mitigation is provided through the air operations regulation as highlighted above, which is considered to be more appropriate due to the fact that specific operational requirements can only be determined at operator/operations level rather than a generic approved training organisation level (i.e. flight crew licensing). Examples of specific operational aspects which need to be considered are as follows:-

•the operating environment e.g. geographic considerations;
•the type of aeroplane used;
•the type of skydiving operation

Furthermore, introducing a pilot rating for parachuting operations would not support the principle of proportionality for the general aviation community. It would not be consistent with the European Union Aviation Safety Agency’s commitment to the General Aviation Road Map which aims to bring positive change to the general aviation community by simplifying existing regulations where possible, introducing flexible measures where necessary, and developing safety promotion to address safety risks.

EASA has therefore concluded that it would not be appropriate to impose additional flight crew training by introducing a formal training programme for pilots in parachute operations.

However, EASA is currently considering taking an action in the form of safety promotion, which may include a dedicated workshop, in order to help foster safe parachute operations.

Status: Open

Sweden

Registration	Aircraft Type	Location	Date of event	Event Type
SE-MES	GIPPSLAND GA8 (TC320 (Airvan))	ESNU (UME) : Umeå	14/07/2019	Accident

Synopsis of the event:

The purpose of the flight was to drop eight parachute jumpers from FL 130 (about 4,000 meters). Earlier during the day the pilot had made two parachute flights with the same aircraft. During the first flight, the parachute club's pilot was accompanied by an instructor pilot in the right seat for a routine check.
The pilot approached the airport and requested to get higher due to clouds, which was granted by the air traffic control without specifying a specific altitude. He then got the clearance from the air traffic control to drop the jumpers, which he confirmed. There was no further radio communication with the aircraft.
Radar data combined with wind data shows that the speed over the ground was declining as the aircraft rose to flight level 136 (about 4,200 meters). Then the aircraft suddenly changed direction to the left to contract rate and began to fall rapidly. The aircraft then traveled a short mile at the same time as it dropped about 1,500 meters, which is a diving of more than 45 degrees. From an altitude of 2,500 meters, the aircraft basically dropped straight down at a sinking speed of about 60 m/s.
Several films of the final phase of the course, taken from the ground, show that the fuselage, without wing and stabilizer, rotated in the horizontal plane with the left wing pointing upwards while the right wing was missing.
A witness to the accident saw at the scene that the rear cabin door was open, but found no signs of life among those on board.

Safety Recommendation SWED-2020-002:

Safety Recommendation SWED-2020-002 (SHK): Review the approval procedures of mass and balance documentation when certifying aircraft approved for parachute operations

Reply No 1 sent on 07/12/2020: In the light of the information provided by the investigation report, the European Union Aviation Safety Agency (EASA) carried out the requested review of the approval criteria of mass and balance documentation when certifying aircraft approved for parachute operations, which included the validation of the aircraft flight manual (AFM) and accompanying supplement N`2 for parachute operations.

Based on the available evidence, the abovementioned documents correctly included in the limitations section the maximum takeoff weight (MTOW) and centre of gravity limits and provided an adequate method for its calculation before takeoff, which were not used in this accident flight.

Taking into account that the AFM and its supplements cannot cover all possible operational configurations with different number of parachutists of different weights, the conclusion of the review is that the mass and balance documentation approval criteria currently in place are sufficiently safe and robust and do not need to be changed.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-FBEJ	EMBRAER ERJ190	EGTE (EXT) : Exeter	28/02/2019	Accident

Synopsis of the event:

Evacuation after smoke filled cabin at start of takeoff.

Safety Recommendation UNKG-2020-020:

It is recommended that the European Union Aviation Safety Agency amends the certification requirements relating to the design, contrast and conspicuity of overwing exit escape route markings on commercial air transport aircraft, to ensure that the route to be taken from wing to ground is immediately apparent to evacuating passengers, in a range of emergency scenarios.

Reply No 1 sent on 11/12/2020: The European Union Aviation Safety Agency (EASA) will assess this recommendation within the frame of the Best Intervention Strategy (BIS) for Emergency Evacuation. BIS are fundamental components of the Safety Risk Management (SRM) programming cycle used to assess the criticality of an issue, and identify the relevant actions for the European Plan for Aviation Safety (EPAS). A BIS report contains the assessment and rationale to determine relevant and proportionate actions.
The first draft of this BIS is planned for Q1/2021. The BIS will identify the need for action(s) and, if necessary, will define the adequate relevant one(s) to be included in the EPAS after consultation with the Advisory Bodies.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-FBEJ	EMBRAER ERJ190	EGTE (EXT) : Exeter	28/02/2019	Accident

Synopsis of the event:

Evacuation after smoke filled cabin at start of takeoff.

Safety Recommendation UNKG-2020-022:

It is recommended that the European Union Aviation Safety Agency, re-evaluate and reduce the 1.8 m height criteria in CS 25.810(a) and (d), for the provision of an assisted means of escape at emergency exits, to minimise passenger injuries and reduce egress time during emergency evacuations.

Reply No 1 sent on 11/12/2020: The European Union Aviation Safety Agency (EASA) will assess this recommendation within the frame of the Best Intervention Strategy (BIS) for Emergency Evacuation. BIS are fundamental components of the Safety Risk Management (SRM) programming cycle used to assess the criticality of an issue, and identify the relevant actions for the European Plan for Aviation Safety (EPAS). A BIS report contains the assessment and rationale to determine relevant and proportionate actions.
The first draft of this BIS is planned for Q1/2021. The BIS will identify the need for action(s) and, if necessary, will define the adequate relevant one(s) to be included in the EPAS after consultation with the Advisory Bodies.

Status: Open

Slovenia

Registration	Aircraft Type	Location	Date of event	Event Type
N710CC	PIPER PA32R	7 Km north of AJdovscina	14/07/2016	Accident

Synopsis of the event:

According to the IFR plan, the aircraft intended to fly from LIPZ to EDDP. A few minutes after entering in Slovenian airspace the pilot called for "mayday" and then vanished off the radar.

After initiating search and rescue the aircraft wreackage was found in a wooded field, approx. 7 km north of Ajdovscina.

The aircraft was completely destroyed in fire.

The pilot and three passengers lost their lives in the crash.

Safety Recommendation SLOV-2020-001:

EASA member states should conduct coordinated activities, via national aviation authorities on yearly basis, with the goal of pointing out and increasing awarness about differences between criteria for flight execuition in the categories of commercial and non-commercial flight operations with light aircraft in general aviation category (based on above mentioned activities and content) as a promotion of flight safety.

Reply No 1 sent on 14/12/2020: The European Union Aviation Safety Agency (EASA), following consultation with the EASA Member States' Advisory Bodies, took the following actions in 2017, which was after the date of the subject accident (2016):

• EASA published "EASA Leaflet 02" (and updated in 2018) on European rules (Commission Regulation (EU) No 965/2012) for non-commercial air operations with aeroplanes and helicopters, which came into effect on 26 August 2016 (https://www.easa.europa.eu/sites/default/files/dfu/EASA_GA_LEAFLET_AIR_OPS_2018_EN.pdf)

• EASA published a "Charter to promote the safety of non-commercial General Aviation flights with light aircraft by flight-sharing companies" (https://www.easa.europa.eu/charter-promote-safety-non-commercial-general-aviation)

In addition, through the Safety Promotion Network (SPN) with the EASA Member States' Competent Authorities, EASA is currently developing some Safety Promotion material for the European Union-wide audience based on that already published by the UK Civil Aviation Authority (CAA) and additional material which is under development by the CAA Norway. Approval has already been given by the CAAs of Norway and the UK to adapt their material for wider use. The new material is being developed for completion in Q1 2021.

Status: Open

Netherlands

Registration	Aircraft Type	Location	Date of event	Event Type
VT-JEW	BOEING 777	Amsterdam Schiphol Airport	21/04/2017	Serious incident

Synopsis of the event:

On 21 April 2017, a Boeing 777 took off from Amsterdam Airport Schiphol in the Netherlands. During the initial climb, the flight crew was informed by Air Traffic Control that probably a tail strike had occurred. The crew decided to treat the event as an actual tail strike and returned to Schiphol. After landing, it appeared that a tail strike had occurred, but that the wear of the tail skid shoe was within limits and no immediate repair was necessary.
At an early stage of the investigation, it was found that an incorrect weight had been entered in the Electronic Flight Bag and that insufficiently applied takeoff power (referred to as thrust setting) probably had caused the tail strike. The Dutch Safety Board
(DSB) investigated similar occurrences of insufficient thrust settings in the past and recommended European Union Aviation Safety Agency (EASA) in 2018 among others to start the development of specifications and the establishment of requirements for an
autonomous Takeoff Performance Monitoring System.

Safety Recommendation NETH-2020-001:

To European Union Aviation Safety Agency and the Federal Aviation Administration:
To take the initiative in the development of specifications and, subsequently, develop requirements for an independent onboard system that detects gross input errors in the process of takeoff performance calculations and/or alerts the flight crew during takeoff of abnormal low accelerations for the actual aeroplane configuration as well as insufficient runway length available in case of intersection takeoffs. Take this initiative in close consult with the aviation industry, including manufacturers of commercial jetliners amongst which in any case The Boeing Company.

Reply No 1 sent on 14/12/2020: The safety issue "Entry of aircraft performance data" was included for the first time in the European Union Aviation Safety Agency's (EASA's) safety risk portfolio for commercial air transport fixed-wing (SRP CAT-FW) in the Annual Safety Review 2016.

To reduce the risks, EASA issued a Safety Information Bulletin (SIB) "Use of Erroneous Parameters at Take-off" to alert operators and flight crew to the safety issue and to

recommend the implementation of operational mitigation measures (published in February 2016: https://ad.easa.europa.eu/ad/2016-02).
The effectiveness of the SIB 2016-02 was evaluated after Advisory Bodies - AB's consultation on 25 Oct 2019 (EASA Advisory Bodies composed of competent authorities and industry), in the frame of the BIS (Best Intervention Strategy) on "Erroneous takeoff parameters".
The European Plan for Aviation Safety (EPAS) 2020 - 2024 - Appendix D - provides information on the BIS on "Erroneous take-off Parameters" planning, according to new priorities defined by EASA and the ABs.

In accordance with it, the Agency developed a strategic approach to mitigate the residual risks associated to this safety issue by encompassing the following short, medium and more long term initiatives:

-Short term actions
The Agency has taken the commitment to prepare dedicated Safety Promotion material to reinforce the messages from the SIB. In line with that a video was recently published on the EASA Website (https://www.easa.europa.eu/erroneous-take-performance-data), where the lessons learned from previous safety investigations led by European investigation authorities are used to raise awareness on the risks associated to this safety issue; the video was further promoted in July 2020 with a blog article on the new EASA Together4Safety Air Ops Community Site (https://www.easa.europa.eu/community/topics/erroneous-data-parameters). Both of them were also shared with EASA's collaborative partners, and a number of airlines have shared this material with their flight crews.

-Medium term initiatives
The Agency will review the SIB 2016-02 in the light of the evaluation carried out, with special emphasis on a more consistent use of the FDM, driving the attention of the operators towards the gathering and analysis of a dedicated list of precursors.

-Long term plans
The Agency intends to re-evaluate the feasibility of development of requirements for onboard system aimed to detect gross input errors, given the maturity evolution of some technical solutions.
To do that an update version of the BIS is planned to undergo a new AB's consultation in Q1-2021.

Status: Open

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-FLBE	DE HAVILLAND DHC8		14/11/2019	Serious incident

Synopsis of the event:

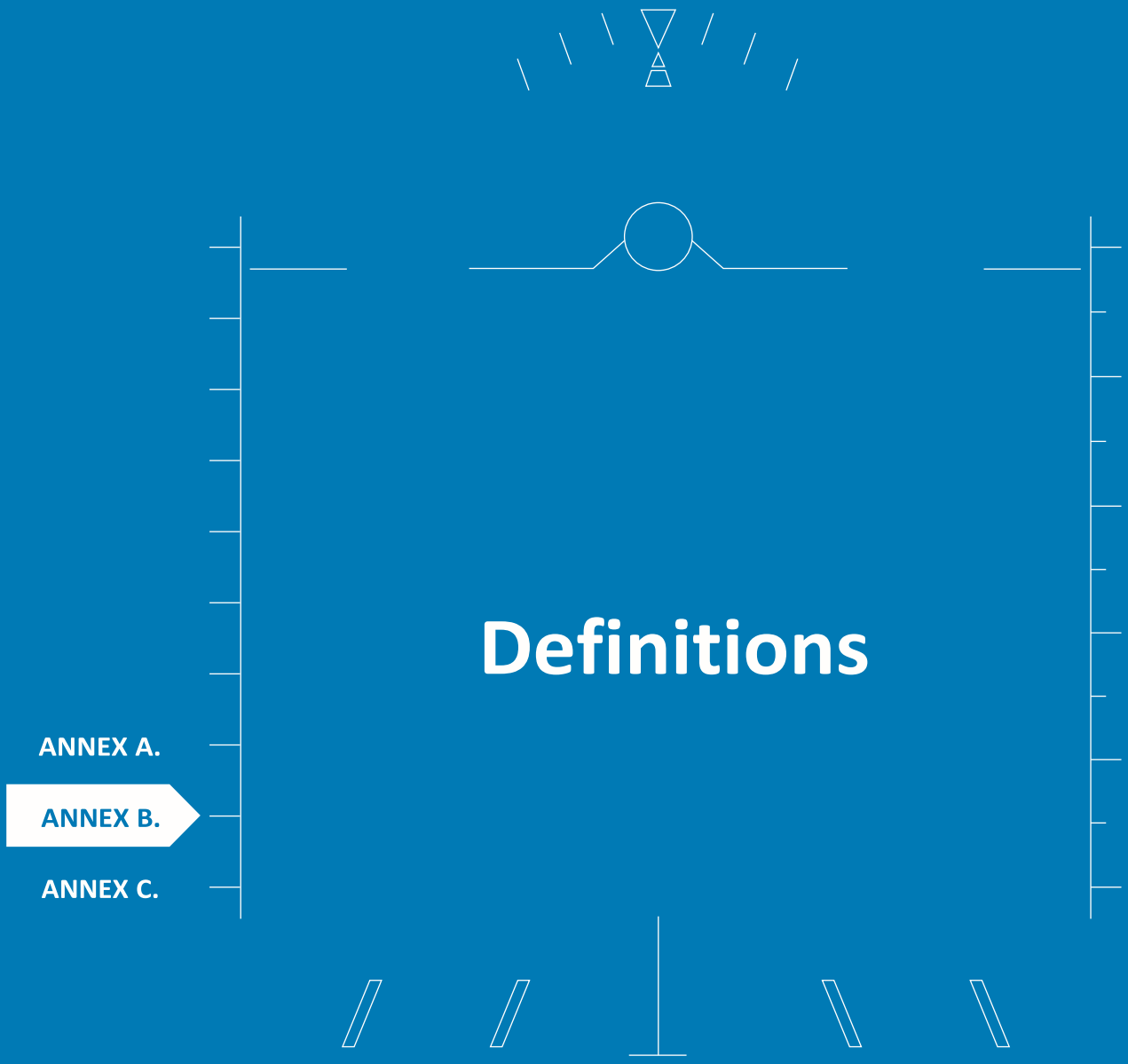
Shortly after takeoff in a strong crosswind, the pilots noticed that both handwheels1 were offset to the right in order to maintain wings level flight. The aircraft diverted to Exeter Airport where it made an uneventful landing. The handwheel offset was the result of a break in a left aileron cable that ran along the wing rear spar. In the course of this investigation it was discovered that the right aileron on G-FLBE, and other aircraft in the operator's fleet, would occasionally not respond to the movement of the control wheels. Non-reversible filters were also fitted to the operator's aircraft that meant that it was not always possible to reconstruct the actual positions of the control wheel, column or rudder pedals recorded by the Flight Data Recorder. The aircraft manufacturer initiated safety actions to improve the maintenance of control cables and to determine the extent of the unresponsive ailerons across the fleet. Three Safety Recommendations are made in this report for the unresponsive aileron and filtering of the control position data.

Safety Recommendation UNKG-2020-025:

It is recommended that the European Union Aviation Safety Agency require that the flight data recorder system fitted to DHC-8-400 series of aircraft registered in Europe record unfiltered data for the parameters representing primary flight control input positions and input forces, so that their original sensor signal values can be reliably established.

Reply No 1 sent on 11/12/2020: The European Union Aviation Safety Agency is analysing this safety recommendation in cooperation with the Type Certificate Holder - De Havilland Aircraft of Canada.
An update will be provided once a decision has been reached on the orientation to be given to this topic.

Status: Open



Definitions

ANNEX A.

ANNEX B.

ANNEX C.

Definitions

Accident: occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

(a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or,
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or,
- direct exposure to jet blast,

except when the injuries are from natural causes, self- inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

(b) the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome); or

(c) the aircraft is missing or is completely inaccessible;

Incident: an occurrence, other than an accident, associated with the operation of an aircraft which affects or would affect the safety of operation;

Serious incident: an incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down.

A list of examples of serious incidents is given below. The list is not exhaustive and only serves as guidance with respect to the definition of 'serious incident':

- a near collision requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate,
- controlled flight into terrain only marginally avoided,
- aborted take-offs on a closed or engaged runway, on a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,
- take-offs from a closed or engaged runway, from a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,

- landings or attempted landings on a closed or engaged runway, on a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,
- gross failures to achieve predicted performance during take-off or initial climb,
- fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents,
- events requiring the emergency use of oxygen by the flight crew,
- aircraft structural failure or engine disintegration, including uncontained turbine engine failures, not classified as an accident,
- multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft,
- flight crew incapacitation in flight,
- fuel quantity requiring the declaration of an emergency by the pilot,
- runway incursions classified with severity A according to the Manual on the Prevention of Runway Incursions (ICAO Doc 9870) which contains information on the severity classifications,
- take-off or landing incidents. Incidents such as undershooting, overrunning or running off the side of runways,
- system failures, weather phenomena, operation outside the approved flight envelope or other occurrences which could have caused difficulties controlling the aircraft,
- failure of more than one system in a redundancy system mandatory for flight guidance and navigation.

Safety investigation: process conducted by a safety investigation authority for the purpose of accident and incident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of cause(s) and/or contributing factors and, when appropriate, the making of safety recommendations;

Safety recommendation: proposal of a safety investigation authority, based on information derived from a safety investigation or other sources such as safety studies, made with the intention of preventing accidents and incidents.

Safety Recommendation of Global Concern (SRGC)[1]: is defined as a safety recommendation made to a State civil aviation authority, to a regional certification authority, or to ICAO regarding a systemic deficiency having a probability of recurrence with potential for significant consequences, and requiring timely action to improve safety.

An SRGC would meet one or more of the following criteria:

a) the deficiency underlying the recommendation is systemic and not solely a local issue;

b) the probability of recurrence of the accident and the adverse consequences are high;

c) the risk to persons, equipment and/or environment is high;

d) the urgency for taking effective remedial safety action is high;

e) there is a history of recurrence of the relevant deficiency;

f) the deficiency underlying the recommendation constitutes a risk to the airworthiness, design, manu facture, maintenance, operation and/or regulation of the involved aircraft type;

[1] Source: ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756 -2014), Part IV Reporting, Chapter 1.6 RELEASE AND DISTRIBUTION OF SAFETY RECOMMENDATIONS.

g) the deficiency underlying the recommendation constitutes a risk to more than one aircraft type, to more than one operator, to more than one manufacturer and/or to more than one State; and

h) the mitigation of the risks associated with the deficiency will require coordinated efforts of more than one entity of the air transport industry, such as civil aviation authorities, manufacturers and operators.

Safety Recommendation of Union-wide Relevance (SRUR): a safety recommendation identified by the European Network of Civil Aviation Safety Investigation Authorities according to Article 7 (g) of Regulation (EU) No 996/2010.

A safety recommendation of Union-wide Relevance (SRUR) would meet one or more of the following criteria:

- The deficiency underlying the safety recommendation is systemic, not related to a specific aircraft type, operator, manufacturer component, maintenance organization, air navigation service and/or approved training organisation, and not solely a national issue, or;
- There is a history of recurrence across Europe of the relevant deficiency.

Technical Adviser (Article 8 of REGULATION (EU) No 996/2010)

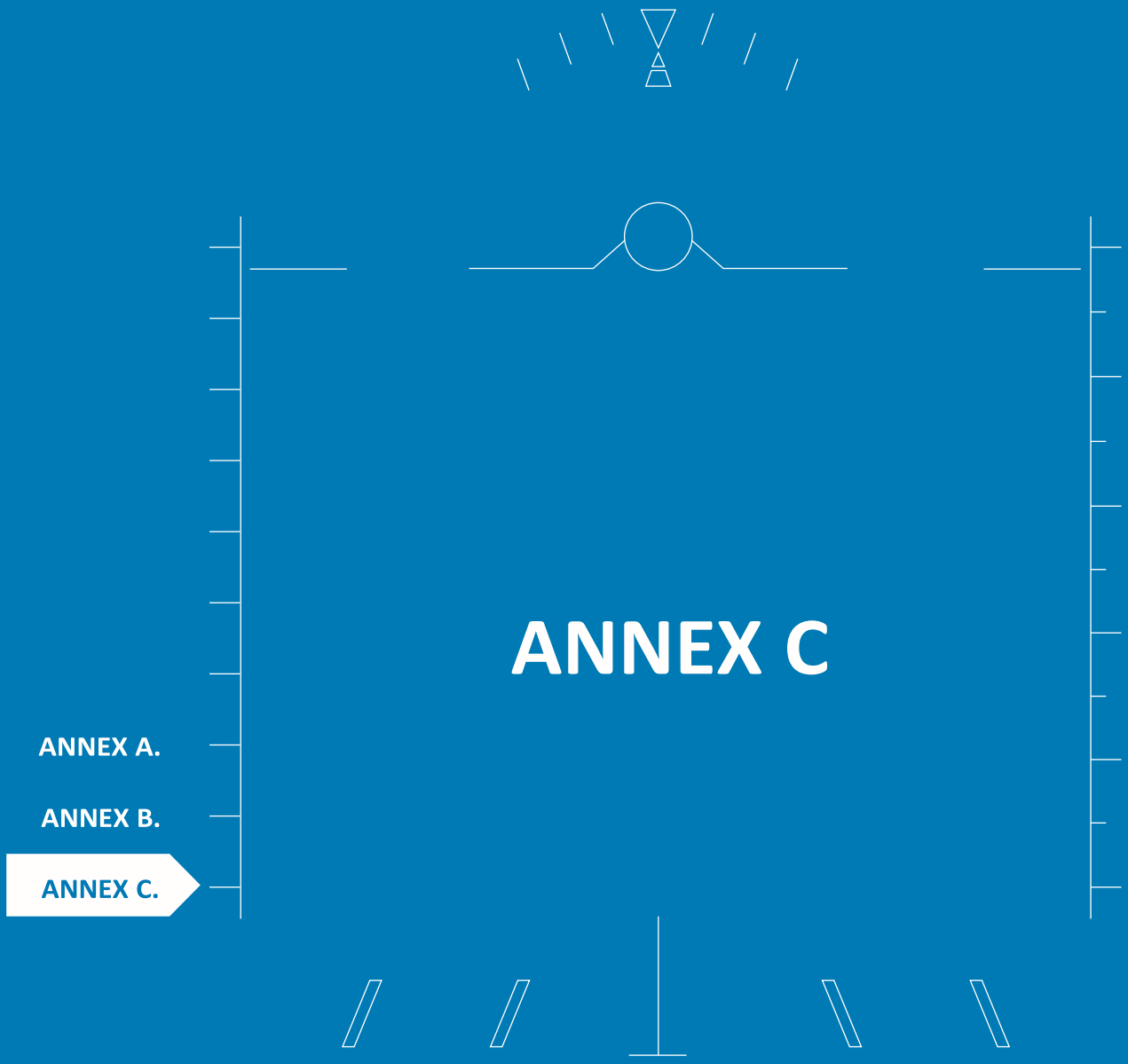
1. Safety investigation authorities shall, provided that the requirement of no conflict of interest is satisfied, invite EASA and national civil aviation authorities of the Member States concerned, within the scope of their respective competence, to appoint a representative to participate:

(a) as an adviser to the investigator-in-charge in any safety investigation under Article 5(1) and (2), conducted in the territory of a Member State or in the location referred to in Article 5(2) under the control and at the discretion of the investigator-in-charge;

(b) as an adviser appointed under this Regulation to assist accredited representative(s) of the Member States in any safety investigation conducted in a third country to which a safety investigation authority is invited to designate an accredited representative in accordance with international standards and recommended practices for aircraft accident and incident investigation, under the supervision of the accredited representative.

2. The participants referred to in paragraph 1 shall be entitled, in particular to:
(a) visit the scene of the accident and examine the wreckage;
(b) suggest areas of questioning and obtain witness information;
(c) receive copies of all pertinent documents and obtain relevant factual information;
(d) participate in the read-outs of recorded media, except cockpit voice or image recorders;
(e) participate in off-scene investigative activities such as component examinations, tests and simulations, technical briefings and investigation progress meetings, except when related to the determination of the causes or the formulation of safety recommendations.

3. EASA and the national civil aviation authorities shall support the investigation in which they participate by supplying the requested information, advisers and equipment to the safety investigation authority in charge.



ANNEX C

ANNEX A.

ANNEX B.

ANNEX C.

ANNEX C

Safety Recommendations classification

This classification has been established in the scope of the safety recommendations taxonomy working group in cooperation with representatives from European Safety Investigation Bodies, Eurocontrol, the European Joint Research Center (JRC) and EASA. The aim of this group was to initiate a taxonomy dedicated to recommendations.

This activity took place in 2007 and is being used to implement a safety recommendation database developed by the JRC.

In addition to common definitions, the taxonomy also defines a unique pre-defined format for referencing safety recommendations. This format is composed by a 4 digits originating state name followed by the year it was issued and then a three digits number (ex: UNKG-2007-001 for recommendation #1 issued by United Kingdom in 2007). Consequently, all references comply with this taxonomy foreseeing that existing safety recommendations will be imported in a central database and shared with a community of users.

Recommendation assessment: assessment given to a safety recommendation by the addressee as defined below:

- **Agreement:** safety recommendation for which the safety concern is agreed by the addressee and subsequent action is planned or implemented.
- **Partial agreement:** safety recommendation considered relevant by the addressee but not applicable and for which a safety issue has been recognised and a new orientation has been given to the recommended action.
- **Disagreement:** safety recommendation considered not relevant or not applicable by the addressee.
- **No longer applicable:** safety recommendation has been superseded or has become no longer applicable.
- **Not Responsible:** safety recommendation wrongly allocated or not in the scope of responsibility of the addressee.
- **More information required:** safety recommendation for which more information is required by the addressee before any action initiated. Additional information should be sent by the originator.
- **Unknown:** safety recommendation which was issued before any tracking implementation status and for which insufficient information to assign any other status has been received.

Response assessment: The classification of the response as determined by the originator (when a response is received):

- **Adequate:** safety recommendation for which appropriate action is planned or implemented or sufficient evidence of completed action satisfying the objective has been received by the originator.
- **Partially adequate:** safety recommendation for which the planned action or the action taken will reduce but not substantially reduce or eliminate the deficiency or for which a safety issue has been recognised and a new orientation has been given to the recommended action.
- **Not adequate:** safety recommendation for which no action has been taken or proposed that will reduce or eliminate the deficiency, or for which the proposed action is considered not applicable/ unacceptable.

- **Response is awaited:** safety recommendation for which no response has been received.
- **Response received awaiting assessment:** response to the safety recommendation has been received by the originator and is awaiting assessment.
- **Superseded:** if the recommendation has been superseded by another recommendation.
- **Unknown:** the safety recommendation is one which was issued before any tracking implementation status and for which insufficient information to assign any other status has been received.

Status of a safety recommendation: progress of the implementation of the response to a recommendation as defined below:

- **Open safety recommendation**: safety recommendation for which the reply has not yet been defined or the appropriate action addressing the safety concern is still in progress.
- **Closed safety recommendation:** safety recommendation for which appropriate action has been taken and completed addressing the safety issue.

European Union Aviation Safety Agency
Safety Intelligence & Performance
Department

Postal address
Postfach 10 12 53
50452 Cologne
Germany

Visiting address
European Aviation Safety Agency
Konrad-Adenauer-Ufer 3, D-50668
Köln
Germany

Tel. +49 221 89990-000
Fax +49 221 89990-999
Mail info@easa.europa.eu
Web www.easa.europa.eu